Date Due

2-8-16			
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7-27-16			

The original of the Winged Victory of Samothrace was found in the ruins of a Doric Temple on the Island of Samothracia (modern Samothraki, but in the Revised Version of the Bible, and in French, Samothrace), in the North Ægean Sea, in 1863. In perfect form the statue represented a winged figure sounding the trumpet of victory. The original was erected about 305 B.C. in commemoration of a naval victory by Demetrius Poliorcetes. Notwithstanding its various fractures, it remains one of the finest specimens of antique sculpture in the Louvre, Paris.

THE WINGED VICTORY OF SAMOTHRACE

EXERCISES FOR WOMEN

CONTAINING HELPFUL SUGGESTIONS ON MATTERS DIRECTLY AND INDIRECTLY RELATED TO EXERCISE AND DEVELOPMENT, AND AN APPENDIX WITH A WIDER RANGE OF WORK, BRIEFLY TABULATED, FOR THE USE OF TEACHERS. FULLY ILLUSTRATED WITH OVER ONE HUNDRED CUTS AND HALF-TONES

WITH ILLUSTRATED DETAILS OF MAT EXERCISES

BY

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AS A TOKEN OF APPRECIATION OF THE BROAD VIEWS
AND HIGH IDEALS WHICH INFLUENCED
MY EARLY TRAINING

PREFACE

THE wisdom of sending out broadcast a series of exercises to be done without supervision is always somewhat doubtful, and the mat-work was, for this reason, at first written in the form of a brief outline intended merely for the use of teachers. But few women can go to a gymnasium, or even have a teacher's direction at home; and most women are very definitely in need of some sort of simple and suitable exercise. The mat-work movements, moreover, are peculiarly adapted to a woman's physical needs, and they have the added advantage of requiring no apparatus. For these reasons, therefore, it was decided that the material should be rearranged and put into a form suitable for general use; and to do this, it became necessary to discuss a few simple matters concerning the bodily mechanism, the exercises, and certain conditions which the exercises are intended to meet. The first three chapters of the book are accordingly devoted to such questions as have come up most frequently in the course of a long practical experience in gym-

nastic work and physical examination. It is hoped that, if done with a certain understanding, the exercises may be at once more interesting and more helpful, and that they may not, on the other hand, be used injudiciously.

The effort to touch main points and to avoid confusion, by giving simply as much of an idea as any one not technically trained could easily assimilate or would care to go into, has resulted at times in statements which may appear superficial and bordering on inaccuracy. The difficulty has been to put down little enough—to give as correct an impression as possible without adding the confusion of details.

The exercises given in the body of the book appear again in the appendix, briefly tabulated for the convenience of teachers, who will find here also a group of still heavier movements, to be used at their discretion. These latter exercises are not at all necessary and are intended only for the woman who has the strength to do them well and with ease. The appendix further includes three sets of chestweight exercises, based on different principles and differing widely from those commonly given. Their present form is the outcome of a long period of experimenting in the effort to accomplish certain ends. If they are taken with careful

attention to position, they will be found more effective as well as more interesting to the pupils than the small, localized movements which have so long been used.

The writer takes the opportunity of thanking those who have, by suggestion and criticism, and in other ways, helped in developing this little book. Special thanks are due Miss Vera Townsend for her cooperation in the development and arrangement of the exercises. The book is printed with the hope that it will be found useful to physicians in prescribing exercises for their patients, to teachers of gymnastics for class and private work, to the college woman who has left gymnasium days behind and can not recall the exercises that she "used to take," and to women in general, especially those whose occupation involves long hours of standing.

F. B.

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CHAPTER 1

TOUCHING UPON A FEW UNDERLYING FACTS AND PRINCIPLES

IT is a generally accepted fact that primitive man was active, that he was of necessity so, or he would have died at the hands of his enemies or from lack of food. The body—the very structure of our bones and muscles—shows a long history of activity. Changes in nature are slow, and, although civilization has come upon us with rapid strides, we are not radically changed in our bodily needs. The conveniences and conditions of modern life have made muscular activity comparatively unnecessary, but our bodies are in consequence suffering in various ways for want of it.

The need for activity

Our chief occupations in civilization are sedentary, or entail mere walking to and fro within narrow walls, or for miles on hard pavements. A certain portion of humanity, it is true, varies this monotony with the limited activity of some specialized form of manual

labor, such as that of the different trades; a much smaller portion has leisure for recreative activity, but in this, too, there is usually specialization, in some form of sport such as football, tennis, basket-ball, or golf. It is the rarest thing to find a human being getting the all-round development and the exercise which his body requires for its well-being, and which it was meant by nature to have. It is in response to the wide-spread realization of this fact that people in later years have begun to turn to more or less artificial movements as a substitute for those activities which modern conditions have made obsolete.

Organized athletics and informal play are often spoken of as *natural* forms of exercise and given the preference over gymnastics, and the fact that they usually take place in the open air is greatly in their favor. Play, however, unless under ideal conditions, including most expert and scientific direction, can not be entirely substituted for the systematic training of the body derived from gymnastics, which, if done intelligently, have a very definite place in any scheme of exercise. The same applies to athletics to even greater extent, for athletics contain so strongly the idea of competition and specialization, that the individual and

Exercise should overcome the faults of environment

his best physical needs are entirely lost sight of. Gymnastics may be defined as a more or less artificial means of keeping the body in condition, and of meeting its natural requirements for exercise, in the midst of the artificial conditions of civilization. And the logical deduction from this is, that *the primary idea in any form of gymnastics should be to offset the conditions which an artificial environment imposes.* This principle, unfortunately, seems to be lost sight of, except in a very general way, in much of the gymnastic teaching that, is being done to-day.

Artificial conditions limit activity

When we stop to consider the matter we realize that, under the ordinary circumstances of every-day life, the body or trunk muscles are called upon for little more than to hold us in a standing or sitting posture sufficiently erect to allow us to do our work, that it is only our legs and arms that we use to any extent, and those in a very limited manner. For instance, as we walk ordinarily certain muscles place the foot down on flat, smooth surfaces a thousand times a day in exactly the same way, and others lift it up again, but certain other muscles of the leg and foot, such as would be used in walking over rough ground or in vigorous hill-climbing, are never called into play. The arms and hands are constantly busy with the

myriad things that have to be done in connection with the mere necessities of living, the incessant handling of small objects (always in front of the body, since nearly everything that we do is done with reference to eyes, or nose, or mouth), so that there is little development except in the muscles of the arm and hand. Indeed, these ordinary activities result instead in conditions which we have constantly to combat—the drawing forward of the shoulders, the narrow chest, and limited breathing. From the standpoint of physical training, *arms and legs are merely adjuncts and of importance only as their action directly or indirectly affects the rest of the body.*

Importance of trunk muscles

The trunk contains the vital organs—it is the engine-room, so to speak, upon which the whole body depends for heat and power. The muscles of the back and abdomen are many and lie in several layers arranged like a firm but elastic corset. It is their important duty not only to maintain us in an erect posture, but to support the organs within and to help to keep them in their proper relation to one another. One of the consequences of a flabby abdominal wall is the dropping down of the various organs, with the result that they can not do their work as they should. A dropping down of the

intestines, a not at all uncommon condition, and one which may be suspected in either men or women who have grown paunchy or whose abdomens are large and saggy, results in some form of intestinal disorder, frequently constipation. The stomach also in such persons will rarely be found in its place (high in the large angle of the ribs below the breast-bone, and leftward). It often moves downward two or three inches and sometimes lower, dragging on the nerves and blood-vessels which supply it and losing its power to digest as it should. The liver, too, and the gall-bladder suffer, either when squeezed by tight clothing or dropped by loose abdominal walls.

Besides these external muscles, there are others lying deep within the abdomen; there is muscle in the walls of the arteries which helps to send the blood-stream along; there are muscular layers in the walls of the stomach and intestines which help to knead and pass on the food and waste of the body; the heart is a muscle, which, by its contraction, drives the blood to all parts of the body; the uterus is a muscle. Hence it can readily be seen how direct is the relation of muscle-tissue to the health and efficiency of the vital organs. The muscle of the upper arm or of the calf of

the leg, though often shown with pride, is of comparatively small importance, and is no proof that the trunk muscles are in equally good condition. The well-developed trunk, on the contrary, is important and does to a great extent indicate the tone of the organs and muscle within.

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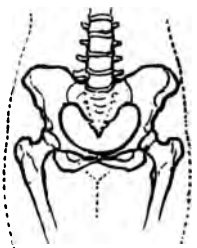
It is a well-known fact, in the economy of the body, that any part of it which is not used tends to degenerate. If the lungs are not used, they become weak and sensitive; if the muscles are not used, they deteriorate and are no longer able to do their work properly. No one who has been leading an inactive or sedentary life for any length of time can suddenly take a mountain-climb, or a gymnastic drill, or spend a day in vigorous house-cleaning, without testifying with aching muscles to this truth. But the muscle of internal organs does not ache or show its weakness in a way so easily recognizable. Lack of tone in the heart, due to lack of exercise or to the lack of proper nourishment of its own tissues, shows rather in such ways as a general languidness and disinclination to activity, in cold hands and feet, or general chilliness.*

* To prevent a wrong application of this statement, it may be well to add that these same symptoms sometimes indicate a heart that is overworked.

Lack of muscle-tone in the walls of the intestines shows itself in sluggishness of action, and is a common cause of constipation; a flabby condition of the uterus and other pelvic organs and their attachments makes them subject to displacement and derangement.

Besides acting as a support to the body and to the organs, and playing an important part in the actual work of certain organs, the muscles aid the heart materially in keeping up a good circulation of the blood throughout the body. When a muscle contracts, it squeezes the blood out of its fibers, and when it relaxes, other blood flows freely into it again. It acts as a pump, keeping the blood in motion and working against that tendency which the blood-stream has, especially when the heart-tone is not very good, to become sluggish and settle in certain places.

Muscles as aids to circulation



The bony pelvis

The organs of reproduction, which lie in the lowest part of the abdomen, in the pelvic region* as it is called, are very

Pelvic circulation

* So called from the pelvis, that basin or girdle of bone which, attached at the back to the lower part of the spinal column, is joined in front, and acts as a support beneath the abdomen and its contents. The large bones commonly called the hips form a part of this girdle.

generously supplied with blood-vessels, and are particularly liable to sluggish circulation. We have already spoken of the muscular walls of the arteries, and their power to help in sending the blood to various parts of the body. The veins, which, on the other hand, have to gather up the blood and carry it back to the heart, have flabby walls and lack such power, and are instead supplied at intervals with small valves which open only in the direction of the heart. By this means the blood-stream is at least prevented from going backward, and its steady progress is materially assisted against the constant force of gravity. Now, it is an interesting fact that the great vein, which gathers up the blood from the abdominal and pelvic organs and the lower limbs, is not supplied with these valves, and presents the difficulty of a large column of blood, which has to be raised to the heart against the pull of gravity, or, more simply speaking, against its own weight.

Dr. Howell, in his "Physiology,"* tells us that when an animal accustomed to walk on all fours is held in a vertical position, so much blood gravitates to the abdomen that, if it

* Text-book of Physiology, Wm. H. Howell, p. 466.

were not for a special effort on the part of the circulatory system to meet the sudden disturbance, the circulation would be greatly interfered with, or might stop altogether. In the case of the rabbit, the abdominal walls are flabby, and so are more easily distended by the weight of the organs and the sudden inflow and accumulation of blood when the animal is held up vertically. We are told that the creature may die if held in this position for some length of time.

Relations of th erect posture t the circulation

The adjustment of the human race to the erect posture, though going on through so many ages, seems not yet complete, and the change from the position on all fours has apparently been harder on woman than on man. But may not the various disabilities which we attribute to her less perfect adjustment to the upright position be in some degree traced to loss of tone due to an increasing inactivity, to faulty clothing, and to similar conditions which society and civilization have imposed?

Relation of deep breathing to the circulation

There are, however, two factors which help materially to compensate this difficulty in the circulation. Of one of these—the internal and external abdominal muscles, and the assistance which all muscle lends to the circulation of the blood—we need not speak again. The

other is the action of the diaphragm, that muscular partition which lies between the chest and the abdomen, separating the two cavities from each other. With the taking in of each breath, the diaphragm moves downward with a gentle pressure on the organs and blood-vessels in the cavity below it; at the same time the size of the cavity above is increased, and the pressure on the heart, lungs, and blood-vessels lying in that cavity is thereby decreased. Naturally, the blood in the abdomen flows toward the chest, where the pressure is less; that is, it is drawn up by suction.

Too much blood staying too long a time in any one place produces congestion. It is not hard to understand, from what has been said, how in cases where breathing is limited and muscle is flabby, the circulation might easily grow sluggish, and an undue amount of blood collect among this soft mass of organs, producing what is spoken of as pelvic congestion. Nor can we fail to realize that anything which might further interfere with the freedom of the abdominal circulation (such as the pressure of clothing or an habitual slump in sitting or standing) would increase this tendency to congestion and to the disorders, often very slow in making their appearance, which result from it.

ongestion

In an article that has lately appeared,* this whole matter of pelvic circulation which we have been considering is discussed in its relation to the menstrual period and the disturbances which commonly attend that period. The writer of the article believes that the constant tendency to pelvic congestion in women (due to the upright position, to flabby muscles, and to the restriction of the circulation and normal action of the diaphragm) plays a large part in the pain of the monthly periods, and in the excessive loss of blood usual among civilized women at that time. She suggests, after careful experiment, that both the pain and length of period may be reduced by the regular practise during the menstrual period, of deep breathing, which is to be taken several times a day, on the back and free from the pressure of clothing. There is no doubt that the regular habit and practise of full breathing at all times, as well as attention to matters of normal posture, dress, and exercise, will help to establish better pelvic conditions.

The foregoing factors in relation to the menstrual period

From this discussion of the structure of the body and its adjustment to the erect posture,

* "Functional Periodicity in Women and Some of the Modifying Factors," by Clelia D. Mosher, A.M., M.D., in the California *State Journal of Medicine*, January and February, 1911. Abstract in *Journal of American Medical Association*, April 29, 1911.

we see the importance of having strong abdominal and trunk muscles and well-supported organs, a circulation as little interfered with as possible, and absolute freedom of diaphragmatic action.

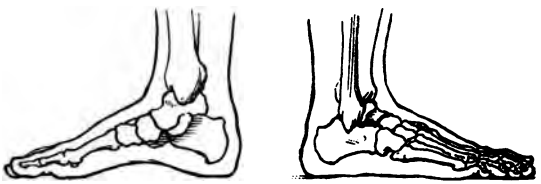
The foot

In these days no gymnastic lesson carries out its purpose of combating artificial and faulty conditions if it fails to give very definite attention to the foot, for while actual flat-foot is comparatively rare, weak feet in various stages of flattening are most common, and we find a constantly increasing number of people disabled for a longer or shorter time as a result of foot strain. Those whose occupations keep them much on their feet seem most liable to serious trouble, and they suffer often from swelling and burning of the feet, or from pains of varying intensity about the instep, ankle, or arch. Nor does the trouble always stop here. Weakened or flattened feet, quite aside from any local pain, can account for such things as headache, swellings at the back of the neck, nervous backache (all resulting more or less from the jar of walking), or pains about the hips, and may even be a not insignificant factor in a case of nervous dyspepsia. The old vague diagnosis of the disorder as "rheumatism," "swelling of the feet," "something wrong with

Weak feet and flat-foot

the nerves and blood-vessels of the feet," has passed, and we know now that these various forms of pain and discomfort are very frequently due to the general flattening of the arch of the foot.

The fact that the foot is made up of a lot of little bones, and is arched or vaulted under-



a. FIG. 1 b.
Showing the bony structure of the foot.
a. The arched or inner side. b. The outer or little toe side.

neath, makes it a very flexible mechanism (Figure 1), but one which, because of this flexibility, is the more liable to get out of order. Ligaments, large and small, fasten the bones together, and two particularly stout ones, running from front to back beneath the foot, act like a bow-string in tightening and holding up the arch; besides these, the leg muscles, attached by their strong, tough tendons to various bones of the foot, play an important part in maintaining the arch; finally, there are the small muscles of the foot itself. All these

Structure of the foot

ligaments, muscles, and tendons help to bind the whole closely together, and to keep the small, easily movable bones in their proper relation to one another. Upon this delicate, flexible structure rests the weight of the body, and it can readily be seen how a little slipping

The foot as a weight-bearing base

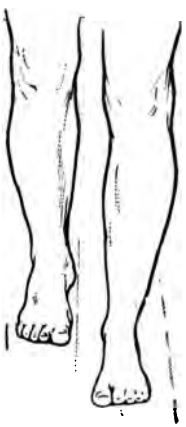


FIG. 2 (Whitman)
The strong position of the foot in walking. Note (1) the weight thrown toward the outer border; (2) the drawing up of the arch and the slight *hollowing* of the inner side of the foot.

FIG. 3 (Whitman)
The weak position in walking—"toeing out." Note (1) the foot *bulging* on the inner side; (2) the weight falling toward the inner side.

of the weight from the proper point of support, or a shifting of the support out of its proper position under the weight, might cause disturbance both in the action of the foot and in its structure.

Normal position of the base

In a normal condition, when the support is in the proper position under its weight, *the foot is turned straight forward* and is slightly hollowed on the inner side. The pressure comes across the front part of it (including the great toe), along the outer border (*i.e.*, along the little toe side), and on the heel—*not* along the inner border where the arch is highest (Figure 2). In this position the foot has perfect freedom of action, and the body weight does not interfere with the spring and elasticity of the arch. Under normal conditions also, the whole arrangement of bones, ligaments, and muscles at the knee is such that instead of continually yielding to its burden, the knee-joint is kept firm and straight; this straight-foot position is throughout a position of strength, of which there is no better proof than the fact of its constant use in boxing and fencing in making a firm base from which to act. To increase the strength of his position, the boxer or fencer will at times even turn the foot inward. But

Abnormal position of the base

society has demanded of us (of girls especially) that we should turn our toes out (Figure 3), and this is what happens when we do so; the thigh-bone twists inward, so changing the arrangement at the knee-joint that the muscles can no longer keep the knee straight; the leg-

bones twist inward, and slip on the foot at the point of support in such a way as to throw the weight toward the inner side of the foot directly upon the arch and to make that characteristic bulging under the ankle-bone where there should properly be a slight incurve. Gradually, with the weight bearing down in the wrong place on the foot, the ligaments and tendons are stretched, the bones are pressed out of position, the arch begins to give way, and the foot, flattening down, loses its spring, and becomes more or less rigid. The strain on the ligaments and muscles, and the pressing of the bones on nerves and blood-vessels, are sufficient to account for the pain that usually attends flattening or flattened feet.

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Generally speaking, insufficient or flabby muscle in the feet and legs, whether resulting from lack of use and development, from general debility, or poor nutrition, is one of the common causes of weak feet; overuse is often a cause, as in the case of trained nurses, cooks, laundresses, and others who are constantly on their feet, for with them, the arch is under continued strain and the tendons are on a constant stretch, owing to the unvaried position and use of the foot. The habitual wrong use of the foot, as a weight-bearing base, together with the faulty

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e foot

footwear which cramps it and limits its action and development, is perhaps the most common source of trouble, although usually there is a combination of factors at work, in which modern pavements and hardwood floors play no small part. The usual close-fitting footwear allows almost no movement of the foot and toes, thereby limiting the use of important muscles, and when the high shoe is snugly laced or buttoned about the leg (who has not seen children's legs fairly bulging over the tops of their tightly laced shoes?), the muscle-action is practically nil. As for pavements, their surface is so even that in walking on them only a few of the muscles which would ordinarily be needed to keep the balance on uneven ground are brought into use, and the monotony of action is such that walking tends rather to a stretching of the ligaments and tendons than to a normal strengthening of the foot.

Faulty use of the foot and faulty footwear

Pavements

The position in which the foot is most at rest is the one in which the toe is stretched and pointed down like the toe of the dancer, for in this position the arch is forced up as much as possible, the small bones slip into their normal places, and the ligaments and tendons, which have been on the stretch, are given a chance to regain their elasticity. Therefore, rising fre-

Position of rest for the foot

quently on the tips of the toes (with the weight strongly on the little toe side), during hours of forced standing, is a rest, and either holding the foot pointed and somewhat pigeon-toed, or taking toe-pointing as an exercise while one is sitting or lying down, is not only a relief, but a means of strengthening the foot and its arch. To keep the foot in this position artificially, however, for many hours at a time, as we do in a high-heeled shoe, only tends in the end to weaken it. It is always *action, not position, which gives strength.*

CHAPTER II

CLOTHES AN IMPORTANT FACTOR

A BOY, up to the age when, as a young man, the serious work of life begins to absorb him, has infinitely greater physical freedom and opportunity to establish good muscle-tone than his sister, and is so dressed throughout his life that the play of muscle in the most ordinary daily activities helps to some extent to maintain that tone. In the case of a girl, however, inertia, the tendency to sit about and be inactive, makes its appearance very early; how early, depends to no small extent upon the attitude of the people who make up her environment, and upon their ideas as to what is "proper" or "improper" for a girl of a given age to do. The tendency to general inactivity usually grows marked with the putting on of long skirts, and loss of movement in the trunk is noticeable with the addition of corsets to the wardrobe. This immobility goes on increasing with years and the wearing of conventional clothes, until there comes that settled, stiff, upholstered look characteristic of many women of thirty or over.

Early conditions at fault

By long association with all that is ungraceful in dress, we have become so accustomed to this strange immovableness of a naturally mobile part of the body, as well as to its abnormal shape, that the majority of us are hardly conscious of it, and when we do notice it, we connect it with some vague idea of "style," whatever that may be. As a matter of fact, a woman often shows the marks of age earlier in the region about her waist than she does in her face. The constriction and stiffness of clothing which cause a loss of flexibility are also largely responsible for the abnormal deposit of flesh on hips and abdomen and are closely connected with many of her disorders.

The difficulty of discussing dress

The discussion of dress, and particularly of the corset, is usually fruitless, for fashion and custom are formidable opponents, and arrayed on their side are several other conditions, which make a discussion difficult; one is, that women as a rule do not understand enough of their anatomy and physiology to connect their indispositions with real causes; another is, that the troubles accruing through years of faulty living and faulty dress often do not make any definite appearance until after middle life, when they are generally considered to have come on suddenly, or to belong properly to that

period. And the one condition which stands perhaps most seriously in our way is the *low standard of health and vitality which has so long been accepted for women*, and which woman, unawakened to higher possibilities of health, strength, and efficiency, has tacitly accepted for herself. There is a whole series of ailments which are traditionally feminine, and to try to raise the standard in the face of the world-wide acceptance of woman's "natural" lack of vitality seems an act of heresy. To hint, moreover, that many of the commonest troubles of the ailing, or not very vigorous woman could be overcome with such simple remedies as fresh air, sunshine, exercise, a proper mode of dress, a moderate and simple diet, and a little applied knowledge of the laws governing her bodily mechanism, is at once to stamp oneself as a fanatic.

Clothes an important factor in environment

Clothes are, however, such a constant and important factor in a woman's environment, and their action on the body is so closely connected with the question of exercise and development, that they cannot fairly be left out of a discussion of these matters, and there are one or two points which naturally demand attention here. In the first place, a woman's dress is essentially ill-adapted to activity, or even

to normal posture, although most of us, having forgotten the freedom of childhood, are no longer conscious of the resistance and irritation of clothing which, nevertheless, are always present and always drawing on our nervous vitality. Shoes are faulty, skirts are a drag and hindrance, and the most vital part of the body is encased in an impervious and inflexible wrapping, and in a series of heating and restricting belts. The development that might come from bending, stooping, and twisting in the ordinary activity of the day is interfered with by this artificial swathing around the waist, which practically cuts the abdominal muscles in two in their action, and prevents the contraction of the back muscles. The result is that both sets degenerate from lack of use. (See "Importance of trunk muscles," Chap. I.) The Chinese woman molds her feet according to a traditional idea of beauty and the proper shape for feet. The European woman, according to some vaguely founded but equally tenacious custom, molds her body to the regulation idea of beauty. Mothers solicitous for their daughters' future appearance and position in society commonly commence the process of making "a figure" by putting growing girls of fourteen or fifteen into corsets, and sometimes their zeal

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leads them to begin on them at the early age of eight. Is there no analogy? When an American woman once spoke to her Chinese cook about the wicked and pernicious practise of foot-binding in his country, he retorted simply, "'Melican girl bind herself where she live!"

Dependence denotes weakness, whether it is upon our morning coffee that we depend or upon a corset, and the amount of dependence in either case is an index of the amount of weakness that has been produced. In other words, the weaker a woman is muscularly, the more she feels the need for support, and the longer she wears a support to do the work for her muscles, the weaker her muscles grow. Many women have reached a degree of flabbiness which, for the sake of the position and proper action of the internal organs, necessitates a support of some kind, but to consider the average stock corset in the light of a support is a fallacy, for, sloping in as it does under the bust, and going in sharply at the waist-line, instead of being a support, it produces an actual downward pressure on the abdomen and the organs within. It acts, moreover, as a hindrance to normal pelvic circulation (see that subject in Chap. I) not only by direct pressure, but in-

The corset as a support

directly through interference with deep breathing and the action of the diaphragm. The bad cut of corsets generally, and often of so-called "reform" waists, is largely responsible for the stooping shoulders and flattened chest of many a young girl, and for the loss of figure and the full, sagging abdomen (with its attendant disorders), which is in greater or less degree characteristic of women in their later years. It is only natural for us to yield to pressure over the stomach and ribs, and for the carriage and figure to be molded by the force which is daily and yearly acting upon it. The only corset which can claim to be a support or should ever be worn is one that is fairly close-fitting over the hips and abdomen, growing looser at the waist-line, and still larger and looser above. This allows the abdomen to rise and the waist to grow larger in sitting, as is natural; the lungs can fill to their lowest point, while the ribs spread apart, and the diaphragm moves downward unhindered. A few of the more recent corsets, mainly maternity and surgical corsets, are on this order, but usually even they are too heavy and stiff to be above criticism, for while a corset may do no harm when a woman is standing erect and motionless, the moment she bends in any direction its stiffness may cause

shape of corset

as much harmful pressure as a corset which is definitely tight at the waist-line. It must be remembered that the body is elastic and changes size and shape with every movement, while the corset is inelastic and unyielding.

The time may come when the corset will be used only if medically prescribed and when it will be considered as great a misfortune to be compelled to wear one as it is now to have to wear a brace of any sort. The truth is, the corset is a support which should be made to measure, with care and intelligence, for a certain definite purpose, just as other braces are made under careful orthopedic direction, and even then the physician prescribing a corset will be more or less at the mercy of the traditions and mistaken ideals of both patient and corset-maker.

Belts

The prevalence of belts and bands in the costume of our women is, no doubt, to some extent, responsible for the prevalence of corsets. Belts worn without a corset or other boned protection are decidedly uncomfortable and may also be harmful, unless they are worn several inches larger than the waist-measure and supported from the shoulders or allowed to rest on the hips. It is a mistake to think that the weight of women's skirts is ordinarily

borne by their hips. The pressure comes, instead, at the waist-line which is always at the point of smallest girth—with most women two or three inches above the hip bones. The only reasonable place to wear a belt is not directly over vital organs, as custom at present requires, but where its pressure will come on bone and heavy muscle, four or five inches below the point called the waist-line. Sarah Bernhardt, avoiding the unnatural and inartistic line directly around the middle of the body, has consistently omitted anything which deliberately defines the conventional waist-line. Her costume is short-waisted in the style of the Empire; or it has a girdle dropping loose and low, which follows more or less the line of the bony girdle of the pelvis, or else there is no demarcation at all and the dress is draped loosely or hangs half-fitted from the shoulders in the princess style.

Since it is not a simple matter for a woman to dress with due regard for health and at the same time to maintain a conventional appearance, it may not be out of place, before leaving this subject, to add a few concrete suggestions for those who have felt the need for something more normal and more comfortable than the garments commonly accepted and worn by

women. In the scheme of dress here described an attempt has been made, first, to do away with a multiplicity of belts and some of the superfluous layers of material usually worn over the lower back and abdomen; second, to arrange the clothing so that there shall be no drag either from the hips or from the shoulders.

The combination, or union-suit

To begin with, the combination, or union-suit, is preferable to under-vest and drawers, as it does away with one belt and one layer from that unwholesome accumulation of material below the waist. Women seem rather generally to fear abdominal chill, and give that as a reason for the many thicknesses they wear over this part of the body, but the infinitely more common complaints of constipation and congestion which are aggravated by the uneven distribution of clothing and heat are apparently never considered. If drawers and vest must be worn for any reason, the top of the drawers may be cut down four or five inches and a narrow elastic run into the hem as a substitute for belt or tape.

Garters

For any one who does not wear a corset the question of keeping up the stockings is always difficult. Stocking-suspenders which go over the shoulders are very tiring, and really a mistake, where the back and chest are not strong, for very few of us find it easy to keep

the chest well pushed up and the spine straight even under the best conditions, without subjecting ourselves to the added drag of clothing. The only substitute sold in the shops is the ordinary garter-belt shaped to be worn around the waist; but this presses into the soft flesh and interferes with the circulation, and the evil is increased when the garters, made of the usual wide, stiff elastic, are attached to the front of the belt, where they exert a direct downward pressure on the abdomen and the organs within. The girdle shown in the illustration (Figure 4) is merely a straight piece of sateen or webbing with narrow webbing straps at the side to hold the elastic portion of the garter. It is worn above the curve of the large muscles at the back, slants down toward the front, and passes just over the point where the thigh bone is attached to the body, *i.e.*, just over the hip-joint. The feeling of insecurity in wearing a belt pushed so far down is soon lost, and for that matter, a belt may be worn comparatively tight at this point, without

FIG. 4
The garter-belt, worn four or five inches below the waist-line.

interfering with the deeper circulation or causing congestion, because here the softer parts are protected by the presence of bone and muscle. For swimming, mountain climbing, and gymnastic exercises, such an arrangement as this gives the greatest freedom and comfort.

The belt at menstrual period

Most important is the matter of the belt at the menstrual period. From the narrow tape, which cuts into the soft flesh, to the vast variety of heavy, stiff, patent harness-like arrangements, elastic or otherwise, all worn tight around the waist and hips, with a thick hot napkin dragging down back and front, there is hardly one contrivance that is reasonable for a woman to wear. There is no doubt that the heat and pressure of all these things tend to prolong the flow, especially in those who, from weakness and lack of muscle tissue, are inclined to a profuse and long period. Whatever is worn, it should *never be worn around the waist*, but pushed down four or five inches to the position of the garter-belt shown in Figure 4. The garter-belt itself may be made to serve a double purpose, but nothing can be more secure, more comfortable, or freer from harmful pressure than the simple little band of half or three-quarter inch elastic worn low, at the point described.

A substitute for drawers and short skirt

Muslin drawers worn over the combination, or union-suit, are rather purposeless, and the short petticoat is equally so, though both are often worn together and clung to with the tenacity of habit and tradition. Each adds an extra belt around the waist, and a layer of material where it is not wanted. When will a woman realize that, quite aside from the question of health, every belt that she wears means just so much flesh added in the wrong place and a loss of figure later on! The trunks shown in Figure 5 may reasonably take the place of both short skirts and drawers. They have neither a band, nor buttons and buttonholes, and are fastened on simply by means of narrow elastic (one-quarter or three-eighths inch) run into the hem. They are cut to dip well toward the front and are worn at the low belt-line. If extra warmth is needed over the legs, a funnel-shaped garment like a skirt is not the most effective thing to put on. The series of extra petticoats that some women feel it necessary

FIG. 5
The trunks worn at the low belt-line.

to wear in winter could be replaced (with great saving in weight, drag, and pressure) by a pair of warm woolen knickerbockers or knitted tights. A pair of sateen knickerbockers is equal in warmth to a light woolen skirt and gives much greater freedom in walking. Figure 6 shows a practical pattern, cut low in front and a little higher at the back, like the trunks, and, like them, to be worn at the line at the top of the thigh-bone before described. There is no other fastening than the one-quarter or three-eighths inch elastic in the hem, and the common objection which women with large hips have to a garment gathered at the top is here met by the simple device of darting the knickerbockers smoothly to measure, and then slitting down the sides about six inches, which allows the top to spread sufficiently as the garment is drawn on.

Knickerbockers

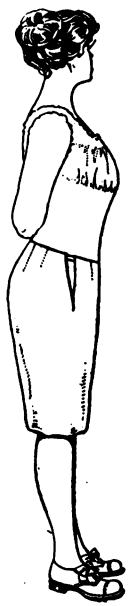


FIG. 6
The knickerbockers, fitted at the top, slit at the side and worn at the low belt-line.

Figure 7 shows a comfortable and neat corset substitute—a corset and corset-cover combined. There are bones in the back and front, and in the sides if wanted, so arranged that they can

The corset substitute

be taken out when the waist is laundered. It is made on the same principle as the good corset, firm below the waist-line, large at the waist-line, and larger still above, over stomach and ribs. This allows of the high carriage of the chest and the expansion of the lower ribs, which the modern, well-developed figure and the normal position of the organs demand. The fact that there is no lacing in the back makes a corset-cover unnecessary, and, since a back-lacing adds little to the freedom of breathing and expansion in front, there is no particular reason for having it. The boning makes it possible for such a garment to follow the lines of the figure smoothly without being tight-fitting, and it may be made amply large for fullest breathing and unrestricted movement, as well as for the ordinary slight changes in size, without making the dresses fitted over it look slouchy. In this way the dresses merely fit the boned waist, and the waist makes a loose, easy protection for the body.

FIG. 7
Front view of the corset substitute.

The main fault with the ready-made under-

waists on the market is, that they have not kept pace with the change of standards for carriage and figure. Most of them seem to be in accordance rather with those ideals for a woman's figure which we see in old portraits—the flat, submissive chest, the depressed lower ribs, and the high, protruding abdomen—and actually tend to produce that sort of figure.

FIG. 8
Side view of the corset substitute, showing adjustment of garter straps to avoid the drag over the shoulders.

Most of the drag over chest and shoulders complained of in under-waists is due to the wrong placing of shoulder-straps as well as to the wrong construction and placing of garters. The shoulder-straps should always be put on as far to the side as the width of the shoulders and chest will permit, not forward over the breasts, which should never have any pressure. In regard to the garters, it is important that they should not be made of webbing nor of wide, unyielding elastic, especially when worn in front where, if stiff or drawn tight, they will undoubtedly drag. A half-inch or five-eighths-inch elastic is firm enough to

keep a properly fitted under-waist from riding up uncomfortably. It should be noted that the straps to which the side-garters are buckled (Figure 8) are sewed on to the waist obliquely, so that the pull comes across the lower part of the under-waist where it is not felt. The garter itself is made with a length of eight or nine inches of elastic below to two or three inches of inelastic strap above—just the reverse of the garter that we buy, which usually has twice as much tape and half the elastic.

The petticoat

While the princess petticoat is theoretically all that could be wished, it has its drawbacks, and the belted skirt seems for practical purposes almost unavoidable. However, one light-weight under-skirt is sufficient for all ordinary occasions, if we do not depend upon skirts for warmth; and, if the band is made several inches larger than the waist measure, is hung up to two or three hooks on the back of the corset-waist, and allowed to drop well in front, it gives about as much freedom as the one-piece garment.

Skirt and shirtwaist

The tailor suit, consisting of jacket, skirt, and shirtwaist, has become a sort of national costume for women for business, travel, and street wear. It is an essential part of the wardrobe, and far too useful to be lightly discarded, and yet, to many women, especially those who wear

no corset or only a light one, the heat, pressure, and drag at the waist-line are a source of constant nervous irritation and annoyance. Perhaps the following arrangement may solve their problem. With seven hooks at intervals on the shirtwaist and seven corresponding eyes on the belt of the underskirt the shirtwaist can be held down and kept neatly in place without a snug belt. With such an arrangement underneath, it is a quick and simple matter to slip into the beltless skirt shown in Figure 9. A few fastenings under the front plait, the bretelles hooked into an eye on each shoulder seam, and the skirt is neatly and safely on, without pins and with no fear of anything wrong at the back. The mere mention of seven hooks and eyes to a busy woman gives her a spasm of nerves, but the amount of nervous force that is poured out during the life of a shirtwaist in its daily pinning and adjustment (especially where tight belts are not worn), in the frequent patching

FIG. 9
The easily adjusted skirt to be worn with shirtwaists.

and darning of pinned-out underwear, not to speak of a mind always uneasy about connections behind, is a far greater expenditure than the force required to sew on the hooks for one final adjustment.

For tramping or camping

FIG. 10
A one-piece bifurcated outing-suit.

There is something of irony in the conventionality that sends a woman off on her summer vacation for rest, freedom, and recreation, drest in a long, heavy skirt of corduroy, or denim or the like, belted in hot and tight about the waist, with an inflexible and impervious corset underneath; or that sends her to the gymnasium for freedom and development, with her trunk still cut by the ever-present belt. Figure 10 shows a one-piece mountain costume that is making its appearance in the West.* Being beltless (for the belt is merely simulated) and loose fitting, such a suit gives much greater freedom than the ordinary skirt and shirtwaist, because

*Patented April, 1913.

there is neither weight nor drag at the waist-line, and it has an added advantage, in warm weather especially, in that it allows the air to pass freely over the body. The suit may be worn, as in the illustration, with a washable guimpe, or it may be made complete in itself with sleeves and high neck. The division, or bifurcation, of the skirt portion is hidden back and front under the full-length panel, which is arranged with fastenings so that it may be pushed aside for cross-saddle riding. Underneath the skirt are washable knickerbockers made after the pattern shown in Figure 6, and the low garter-belt completes the suit. The whole makes a graceful and thoroughly presentable costume in which there is no need for the wearing of a single belt, nor yet for corset or corset-waist.

FIG. 11
The beltless gymnasium suit with washable guimpe.

The beltless gymnasium suit

Figure 11 shows a gymnasium suit in the form of a one-piece slip which substitutes a low-dropping girdle for the usual belt. It has another great advantage over the ordinary gym-

nastic costume in being worn with a washable guimpe or blouse, a thing so necessary to cleanliness in a garment in which exercise is taken. The low garter-belt is worn with this suit.

SHOES

The abnormal and ungraceful walk

It does not take a trained eye to detect "weak ankles" or the faulty use of the feet in walking. Any one whose attention has once been called to it will notice how common a thing it is. On any street it is possible to see women and girls wobbling unsteadily on their exaggerated heels; their toes are turned out, making them walk with a side-to-side movement in-

FIG. 12
A common sight—the ankles bulging inward under the weight of the body.

FIG. 13
A front view of Fig. 12. "Toeing out" has lengthened the inner line of the foot and allowed the body-weight to fall to that side, pressing down the arch.

FIG. 14
A normal, springy step. Notice that the weight falls on the outer side of the foot and that the line of action is straight forward.

stead of straight forward, and resulting in an unnecessary amount of motion about the hips; watched from behind, their ankles are seen to bulge inward (Figures 12, 13) with every step. A side view usually shows the knees bent and

often conspicuously in advance of the rest of the body. In many cases the top of the head jars with each impact of the heel. The person who walks with the toes habitually turned out (Figures 12, 13) is very likely to walk and stand with the knees constantly bent, and habitually bent knees in turn result in a flat, wooden, springless use of the foot. (See Chap. I, "Abnormal position of the base." Also compare with the normal position, Figures 2, 14.) A weak and careless use of the foot and knee is followed by a careless, loose use of the hip-joint and a bad position of pelvis and abdomen; while the jarring of the spine is one of the most common though least realized evils of both the weak foot and the high heel. The abnormal position of "toes turned out," which is taught in ballet dancing (taught also in our gymnasiums unfortunately, although physical trainers have had opportunity to know better), results in a short time in a distorted foot and an ungainly and abnormal walk. One of the most admired Russian dancers of the day who has lately been delighting us with her marvelous performances is an almost pitiful object as she *walks* forward, splay-footed and with bulging ankles, to make her bow in response to the enthusiastic applause which her dancing has called forth.

Some common faults in women's shoes

Neither bad training nor the lack of training is wholly to blame for an ugly walk; the shoe is often largely at fault. The misuse of any part of the body affects the whole, and brings a train of results not easy to foresee nor yet to trace, and shoes and the use of the feet have a closer relation to general health than we ordinarily suppose. (See "Weak feet, and flat-foot," Chap. I.) But in the province of footwear, fashion rules as it does elsewhere, so that it is usually a struggle to get a reasonable, comfortable shoe. Quite aside, however, from the caprices of fashion, there are two or three common mistakes in the making of women's shoes which manufacturers could remedy without visibly changing their models or interfering with their salableness. One fault is that, in order to avoid the slipping and chafing at the heel or to get any support through the arch and instep, a woman has to buy shoes that are too tight through the ball and toe. Most women's shoes could and should be made several sizes smaller in the heel and waist in proportion to the forward part, in order properly to clasp the waist and heel, and at the same time give the toes and ball their necessary freedom.

Another common fault is that the shank, the narrow part of the sole which runs under the

arch, is too long in proportion to the rest of the shoe. The short shank, according to one of our orthopedic surgeons,* gives better support to the arch, and it is for want of the short shank that many women have been driven to the wearing of high heels.

A third fault is that, in order that the sole may wear out evenly, shoes are made with a wrong balance, *i.e.*, they are made to tip the foot slightly inward when they are new so that, unless the wearer is conscious of it and makes a very definite effort to force the weight more toward the outer border in the first few days of wearing and "breaking in," not only is the habit apt to be formed of walking with the weight too much over the arch, but the foot becomes more and more forced into a wrong position by the increased tendency of the shoe to give way inward as it is worn. This applies especially to the very low-cut summer shoes, or so-called "pumps," in which the shoemaker's effort has been directed toward making a perfect fit along the outer top edge. To do this, he has drawn the outer side of the upper so tight that the foot is forced inward (Figures 12, 13), and this, together with the narrow toe and the high heel with its diminished bottom

*James T. Watkins, M.D.

surface, makes the "pump," which might be a very excellent foot-covering, a very poor one.

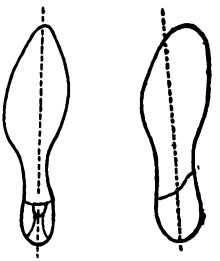
Made-to-order shoes

Made-to-measure shoes are rarely successful, partly because a shoemaker deviates but little from his traditions whatever orders are given him, partly because few of us know what the real difficulty with our shoes is. It is safe to say that remedying the defects of heel and shank mentioned above would bring comfort and relief to many feet, and that the most practical way to get desired results is not through having shoes made to measure, but by having them made on what is called a "combination last." For instance, if one shoe fits in the waist and heel, and gives support under the arch, and the next size or two larger suits the ball, and gives a comfortable spread to the toes, let the order combine these two shoes in terms of the regular stock sizes. Such directions are more apt to be understood and carried out.

Judging a shoe

Aside from the points to which we have referred, one may judge a shoe largely by looking at its sole. The shoe that has the toe directly in the middle (Figure 15*a*) tends to throw the weight inward and to twist the foot outward, but in a rightly shaped shoe, a line drawn through the middle of the heel and passing forward strikes the forward part of the shoe

in such a way as to leave two-thirds of the toe space to the inside of the line (Figure 15*b*). This shape tends to throw the weight toward the outer border of the foot and to twist the foot inward, thereby drawing up the arch. A good shoe then, *i.e.*, one which bears some relation to the anatomy and normal shape and action of the foot, twists inward, so that the two shoes held up together look pigeon-toed, the line along the great toe is comparatively straight, the shank is broad, and the heel has a broad bottom surface. Although the height of the heel is a much-discussed question, the consensus of opinion is undoubtedly in favor of the *moderately* low broad heel, which comes down flush with the back of the shoe, instead of slanting in under it as the French heel does, for the *stability* of the foot in action is, as we have seen, an important point. A Thomas heel (see Figure 15*b*), made to extend under the arch along its inner side and raised a trifle



(a) FIG. 15 (b)

(a) A faulty sole showing: the narrow shank; the pointed toe coming directly in the middle; the larger portion of the sole lying to the *outside* of the middle line; the reduced heel surface.

(b) A good sole showing: the inward twist; the larger portion of the sole lying to the *inside* of the middle line; the broad shank; the straight line along the great toe; the ample heel surface.

at the inner corner, can easily be put on any shoe, and not only helps to support the arch, but by its augmented surface adds stability and gives spring to the step. Quite aside from the question of height of heel, there seems to be a relation between the amount of jar in walking and the amount of heel surface—the larger the bottom surface, the less the jar.

It is not possible to find or make one style or shape which will suit all feet, nor to lay down narrow rules concerning the kind of shoe which every one should wear. Feet that have been molded for many years by faulty shapes will often find it impossible to wear with any comfort a normal shape. Many a "common-sense" shoe has the redeeming feature of being large enough through the toes, but it is usually large everywhere, and so much too flat in the heel, in the arch, and in general build that it often results, in spite of the theory on which the last has been built, in flattening down the arch and causing pain and trouble. Fortunately nearly every shop now carries one or two styles of fairly reasonable walking shoes for women, which may often be improved by such simple means as adding a lift to the heel or taking one or two lifts off, or by changing the shape of the heel altogether. It is a good plan to keep on

The "common-sense" shoe

hand several pairs of shoes, each with its own good points,—since no one shoe has all of them —and to wear them in rotation, changing even several times a day if the feet are sensitive.

In the end, though this is hard for busy people to do, there is nothing like getting away from pavements and hard, packed roads, and walking in the woods, over grass-covered hills and fields, or over rough or uneven ground wherever it is to be found, to rest weary feet and to help them to recover their tone.

For tired feet

CHAPTER III

SOME SUGGESTIONS WITH REGARD TO EXERCISE

Exercise and physical training not synonymous

EXERCISE is not, as is often vaguely supposed, a magic remedy for all ills, nor can it be taken passively, like a dose. Results are greatly influenced by the intelligence and mental attitude of the pupil, for the understanding of underlying facts and principles not only affects the form and manner in which the movements are done, but brings about gradually a conscious or unconscious regulation of those faulty conditions which it is the purpose of the more or less artificial exercises to overcome. To be really effective, the conception of physical education or training must contain something more than the usually accepted and narrow idea which makes it synonymous with exercise. It must include a training with respect to everything in the environment which relates to the condition and the highest efficiency of the human machine. It is to be regretted that in most of our public schools, physical training has, for one reason or another, lost or never taken on the broader idea, but has settled down complacently to a mere system of specialized

muscular movements, such as dancing here, games and athletics there, or some sort of condensed "setting-up" drill, which all the pupils take in common. It is not reasonable to expect that mere exercise taken for half an hour once or twice a week, and done by imitation, with no particular initiative, intelligence, nor conscious sense on the part of the pupil, can successfully cope with the various adverse forces which are constantly at work in the daily environment.

The important time for physical training

Systematic physical training in its broadest sense, between the ages of eleven and eighteen, probably produces deeper and more lasting results than at any other period * and good muscle habits and muscular development acquired within the first twenty years of life are never, under any reasonable conditions, wholly lost. This does not mean that systematic training before this time is not important, but eleven is commonly the age when girls begin to be inactive, and when there is nothing offered to take the place of the play that most of them have had so far. Habits are readily formed and ideals easily planted at this period, and the habit and love of

* It is not possible to speak here of the necessity for the very thoughtful and intelligent direction of a girl's activities in the early years of puberty, nor of the folly of violent games, athletics, etc.

exercise, like the love of books and the habit of reading, must be formed early; interest is keen, and it has been my observation that girls under eighteen have more respect for health and more interest in their own physical welfare than they ever have later.

But there is really no time from babyhood to old age when the muscles do not respond to regular exercise and when *suitable* exercise does not contribute to our well-being and efficiency. It is as normal and necessary to us all as rest or the taking of food, though because the need of it is not so immediate and apparent, it is usually neglected. Exercise is as important an agent in helping to get the waste material out of the tissues and out of the body as it is in helping toward the proper assimilation of food and the building up of the body.

Conditions to be met by exercises for women

The basis for the various movements and positions which follow will be found in the matter of the previous chapters, a reading of which will help toward a more successful use of the exercises. A brief summary of the conditions which exercises for women must take into consideration shows lack of abdominal and back development due to lack of early training and opportunity, and to the constant interference of clothing; poor pelvic circulation due

to lack of muscle, to faulty clothing, and lack of deep breathing; vital organs lacking tone, often out of position, from the action of clothing and lack of abdominal muscle; weak ankles and flattened arches due to muscular weakness, faulty habits, faulty footwear, and hard pavements; finally, the fact that women's occupations (too frequently their inclinations also) keep them much indoors and require a disproportionate amount of either standing or sitting.

The aim of mat-work is to give the greatest amount of trunk, and especially abdominal, development with the least amount of strain

The aim of mat-work

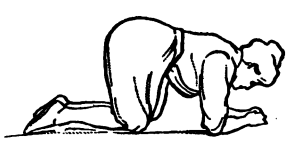


FIG. 16
The "knee-elbow" position, the knees about 14 or 16 inches from the elbows.

FIG. 17
The "knee-chest" position.

and fatigue. With the body in a reclining or quadruped position—the "knee-elbow" (Figure 16) or "knee-chest" (Figure 17) position—the muscles which have kept us constantly in the upright posture are at rest, the pelvic circulation is facilitated, and congestion relieved, because the blood now gets away easily through

Quadruped position

the great valveless vein of which we have spoken ("Pelvic circulation," Chap. I); the abdominal organs are in a position in which the drag and downward tendency are relieved, the arches of the feet are freed from weight and pressure. It is the baby's mat-work—his creeping, stretching, sprawling, and squirming—that strengthens and prepares him to assume the erect posture; and when we find ourselves weak fundamentally, it is not a bad idea to get back to fundamental positions and exercises. The fact that the mat exercises are fundamental makes them especially valuable, but as most women are weak abdominally, and as the muscles acting in these exercises are close to organs sensitive to strain and liable to congestion, the work should be used with a due amount of caution by both teacher and pupil. The exercises are not as light as they appear to an onlooker. Many teachers who have been taught to believe in the conventional standing drills and exercises on apparatus ordinarily consider this lying-down work as suited only to weaklings or invalids, and with this mistaken attitude they give it to their classes in such heavy doses as to be harmful, or never give it at all. The mat-work is adapted to home use because it requires no apparatus, but it should also have

Mat-work should be taken with care

its place in the work of every women's gymnasium, especially in the work of night classes whose pupils are so often drawn from the shops. Why should they be kept on their feet during the whole of another hour in the long day?

The costume for exercise

It is hardly necessary to mention here, after what has gone before, that exercise to be effective, or in many cases safe, should be taken in a costume which avoids the faults of ordinary dress and gives freedom in every way, not forgetting that the trunk actually changes girth in different positions. It is interesting to note in this connection that there is hardly a gymnasium suit in use to-day which is not made with one to three belts, "snug enough to stay in place," or which is not worn with one, two, or more bands on the garments underneath.

The time for exercise

The time for exercise is largely an individual matter. It is unwise to draw the blood away from the stomach by exercising within an hour or more after eating, and for many people it is not advisable to take any very vigorous exercise before breakfast. A few minutes of deep breathing, yawning, stretching, and squirming before getting up in the morning is normal and wholesome for any one. For older people whose arteries have lost some of their elasticity, or in

cases where there is general languidness or lack of vitality, or where the heart is not very strong, this mild exercise increases the heart-beat gradually after the night's quiet, instead of starting it up suddenly, as happens when one springs energetically out of bed on waking. We have all noticed how a cat, after having been curled up asleep for some time, wakes herself with a long, leisurely, comfortable stretch and a final humping of her back.

Exercise need not be taken in a formal way for a full hour at a time, in order to be beneficial; a woman who is suitably dressed, without corset or belts, may take, for a few minutes now and then during the day, those movements which she finds most restful to her after the particular thing she has been doing. A busy physician once told me that, during his long consultation hours, he rested and refreshed himself, in the brief intervals between the going out of one patient and the coming in of the next, by taking certain stretching exercises to keep his blood moving. While probably no tangible muscular development could be acquired by such limited practise, it is surprising to see how even a very mild use of the muscles, if regular, frequent, and persistent, will improve their tone.

SUGGESTIONS REGARDING EXERCISE

THE BATH

The bath is an important adjunct of exercise, for the skin must be cleansed of the waste matter that it has exuded, and the pores must be closed, to prevent chill. To accomplish this, it is by no means necessary to jump into a tub or to take a shower, and the cold tub and cold shower are not to be recommended in most cases, as the sudden driving of the blood from the surface when one is very warm is apt to be too great a shock. Besides, warm water is more cleansing than cold, so that it is better to use warm water first and then the quick rinse with cold water afterward to close the pores.

But there are more ways than one of caring for the skin. A rub-off with a towel, wet and then well wrung and shaken out, makes a good substitute for the tub or shower on cold days or when the vitality is not quite so high as usual. As a daily bath, also, the damp toweling may be used with tonic effect by those who find that they do not react well after a more generous application of cold water, and it may be found desirable to use a dry towel after the wet one. A dash of cold water about the neck and chest after one grows accustomed to it makes a pleasant finish for the towel-bath. Alcohol and

water, in equal proportions, or weaker, rubbed on with the hands or a sponge, and dried off with a rough towel, is refreshing and cleansing, and particularly good for those who take cold easily. A saturated solution of sea-salt in water is another excellent thing for a rub-down; put on briskly with the hands and briskly polished off with the towel, it leaves the skin soft, velvety, and refreshed. In all these cases, it is possible to rub, and dry, and cover the body, a portion at a time, if lack of vitality demands it. Almost any one can train and harden herself not only to endure, but to benefit by and enjoy, greater exposure to air and to cold water, but the training has to be gradual.

If the skin is dry or the climate dry, a pure olive or almond oil rubbed into the skin after the bath (and rubbed off again if it is not readily absorbed) is very soothing and allays the nervous irritation which is often felt under the circumstances with the too frequent use of water. In fact, the oil-rub may well be substituted occasionally for the water bath under such conditions, for oil generously applied and rubbed off again thoroughly with a soft towel will be found in itself very cleansing. In dry weather or a dry climate, the more the skin is washed, the dirtier it seems to get, and this is

not altogether imaginary, for frequent washing dries the natural oil out of the skin and roughens it so that it only catches dirt the more readily. Again, in regions where the water is hard, people may bathe religiously once a day or oftener, and yet have skins that are fairly gray with clogged pores, showing that the exudations have not been dissolved and washed away. It is not an uncommon thing to wash the face and, as one dries it, to have the feeling that it has been smeared over with a thin coat of varnish, especially if one has been so misguided as to use a little soap. A little almond meal (unscented), borax, or ordinary baking soda used with hard water, though somewhat sparingly in order not to dry the skin, will act as a solvent and make the bath more cleansing.

Briefly, the matter stands thus — that ordinary bathing is not bathing under all circumstances and in all climates, that the main purpose of the bath is to cleanse the skin and to keep the pores free; that water alone will not always accomplish this, for all people alike, and that there are other ways of keeping the skin in order besides getting into a tub. This does not mean that the tub bath is to be given up altogether. The tonic effect of the cold

bath or of the rapid hot bath, for certain people under certain conditions, has been proved and accepted; and the necessity for most people of a warm bath every few days, in addition to some kind of daily grooming, is equally well established.

GENERAL DIRECTIONS FOR THE MAT EXERCISES

I. One of the first requisites for proper exercise is plenty of fresh air. If the exercises can not be done out of doors, then let in as much outdoor air as possible.

II. The mat exercises may be taken on a bed (preferably a firm, flat one), or on a mattress or heavy rug on the floor.

III. In order not to merge into one the several movements of an exercise but to keep them distinct, giving each its full value, the pupil should count one for each movement as it is done, thus—"one, two, three" for a three-part exercise, and so on. The parts will be found marked in the exercise, *1st count*, *2nd count*, *3rd count*, etc.

IV. The letters *a*, *b*, *c*, merely mark variations of the exercise under which they are placed, each variation a little harder than the

last, and each in its order to be substituted for the last when that one has become easy.

V. It is always better, after a few repetitions of one exercise, to go on to another, using a different set of muscles (returning later to the first if so desired), than at any time to take a movement to the point of fatigue. Tired muscles never do their work accurately or well. The idea that if it is good to do an exercise six times, it is better to take it twenty times, is a mistake, and often leads to strain. The mat-work offers nothing in the nature of a feat, but is made up of simple developing exercises, each movement of which should be done in as perfect form as possible.

VI. Some women find it tiring to lie at full length on the back, especially those who are large through the hips and buttocks. The strain is relieved by drawing the knees up a little and, where the exercise calls for a straight-leg position, by keeping one knee bent while the other leg is taking the movement.

VII. Before beginning the exercise, the pupil should lie for a few minutes in a state of relaxation, or should spend a little time in trying to acquire the ability to relax, for that ability not only saves us daily much good energy and nervous force, but also comes to our aid

in times of sleeplessness, pain, or illness. To be able to relax perfectly also means to be able to rest thoroughly—to get the greatest amount of rest in the shortest time.

VIII. The pupil should notice frequently whether or not she is breathing freely and rhythmically, for there is a tendency to hold the breath both when an exercise is too heavy and also when the pupil is naturally inclined to be rigid. Thus the breathing may indicate to the pupil whether she is properly relaxed or not, and also whether she is taking work that is somewhat beyond her strength.

IX. The breathing exercises are intended to be taken not only in the order in which they come in the group, but to be repeated here and there as a rest from more strenuous exercises.

CHAPTER IV

BEGINNER'S GROUP OF MAT EXERCISES

THIS first group is made up of the simpler and lighter exercises, which are not, however, too simple to be practised to advantage for many weeks. Remember that the greater the need for abdominal exercises, the greater should be the caution in taking them and in advancing to heavier movements. (See Chap. III, "Mat-work should be taken with care.") It is not necessary to take an exercise six times, merely because that number is suggested for the average individual, nor to take all the exercises in the group at the first practise. Each individual must learn for herself what is best for her to do. She should regulate her exercise according to her own strength and experience, not according to what some one else can do. A beginner is always inclined to be tense and rigid in her efforts to follow directions conscientiously, and is therefore more liable to bring about strain or to tire herself unduly. The safest way to take mat-work is with a sense of comfort and enjoyment rather than a sense of duty.

And relax, always relax! Only a few muscles are needed at a time for each particular movement; all the others should be at rest until they are wanted.

To relax—drop down on a bed, or mat, in any comfortable position, with the feeling that you do not have to move for hours, and that nothing can make you get up. Then slowly get over on to the back and lie with the legs straight down (or one knee bent) and the arms flung out. Drop the eyelids sleepily, drop the tongue and jaw feebly; feel heavy, limp, all over; hear nothing, *i. e.*, do not let the mind hear what comes in at the ears. Think nothing; or if you must think, put your mind on your breathing. Breathe slowly and rhythmically, sinking away more and more into a state of sleepy indifference each time the breath goes out, and waiting a lazy moment before taking the breath in again. Now and then, test the hand or foot to see whether it is limp and heavy, too heavy to lift from the floor. Loosen the curled fingers, and smile a little to relax the muscles of the face, which are tense more often than we realize.

I. POSITION—Lie relaxed upon the back, draw the knees up a little until the soles of the feet rest easily on the floor (or bed, or mattress—we shall hereafter

for convenience, speak of the exercises as being done on the floor).

EXERCISE—From this position, bring the left knee up as high as possible toward the chest (Fig. 18), about

FIG. 18

six times, dropping the leg back to position again and relaxing it after each upward movement. Do the same with the right knee.

II. POSITION—On the back as before, knees bent, and feet resting flat on the floor.

EXERCISE (*a*) Drop the left knee down sideways toward the floor as far as it will go *without strain*, leaving

FIG. 19

the foot in place though turning it on its side. (Fig. 19.) Then raise the knee again to its first position. Take the

movement about six times with each leg, or with right and left alternately.

(*b*) Drop the knees down together to the left, or rather let them "flop" down lazily, then raise them and

FIG. 20

let them "flop" over to the right side. (Fig. 20.) Alternate thus about six times.

(*c*) Drop the knees down in the same way as in (*b*); then, keeping the feet firmly where they are, stretch down comfortably with the knees until the body rolls

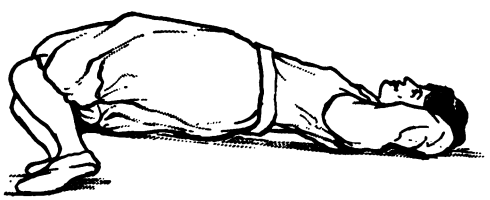


FIG. 21

on to the side a little and the buttocks come up off the floor. The shoulders remain on the floor. (Fig. 21.)

III. POSITION—On the back, with the knees bent as before.

EXERCISE (*a*) Raise the arms straight in front of the body and over the head, until they touch the floor,

reach up with the finger-tips, *stretching comfortably* as you do on waking in the morning. Then carry the arms back to the sides again. Do this five or six times. (Fig. 22.)

(*b*) Take the same exercise, drawing in a full breath as the arms are raised, and letting it out as the arms return to the sides. Develop a good yawn now and then—it will help to relax and rest you. Do not hold the breath. Take this exercise about six times.

(*c*) At another time, instead of carrying the arms forward overhead, vary the foregoing exercise by moving them out sideways through a half circle on the floor

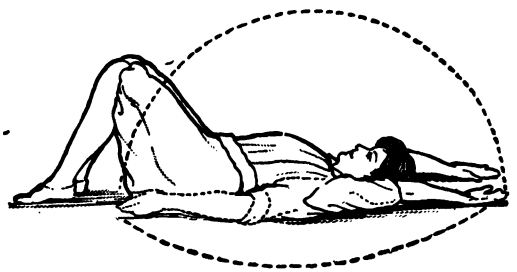


FIG. 22

to the same position back of the head, taking a deep breath as the arms move toward the head, and letting it out as the arms come back to the sides. (Fig. 22.)

Daily deep breathing is one of the best exercises that a woman can take; it should be taken at frequent intervals during the day; not always in the formal way, nor in the position given here; but wherever and whenever it is

possible to get good fresh air. Try it while walking in the street—a breath to so many steps; stop to take a few inhalations when passing an open window in the house, make it a rule before going to sleep at night, for it is helpful where there is a tendency to sleeplessness. Practise it regularly on waking in the morning; in short, form the habit of slower, deeper breathing at all times, for it has a quieting effect on heart and nerves, and helps the circulation. (See Chap. I, "Relation of deep breathing to circulation.") Moreover, the oxygen which we breathe in with the air is a food. Although we do not ordinarily think or speak of it as food, it is as important to the upkeep and nutrition of our bodies as the food that goes in at our mouths, and it is likewise a source of vitality and energy. Most of us, through a habit of lazy, shallow breathing, and too much living indoors, keep our blood oxygen-poor.

IV. POSITION—On the back, but this time with the legs stretched down and the heels together.

EXERCISE (*a*) Bend the left knee out sideways, drawing the foot along the floor until it is close to the right knee. (Fig. 23.) Do this about six times with the left, then as many with the right leg, returning to position after each bend.

When this exercise has been practised for a number of lessons, take the following in its stead, starting from the same position and beginning again with the left leg:

(*b*) *1st Count*—Bend the knee out sideways, drawing the foot up to the other knee, as before.

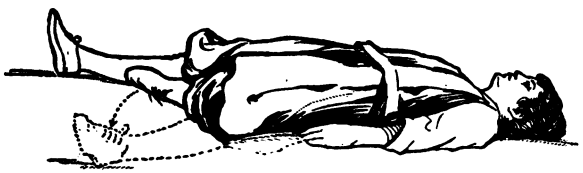


FIG. 23

2nd Count—Raise the knee until the sole of the foot is flat on the floor, but without moving the foot from its place.

3rd Count—Slide the foot straight down until the leg is stretched to the position you began with.

After having taken this exercise as a whole six times with the left leg, repeat it as many times with the right.

After a month, more or less, drop IV (*b*) and take in its stead the following:

(*c*) *1st Count*—Bend the knee sideways as before.

2nd Count—Stretch the leg out obliquely, sliding the foot on the floor. (Fig. 23—dotted line.)

3rd Count—Draw the leg back to its first position, sliding the heel on the floor.

In exercises for the foot, the main idea is to

force up the arch and draw all the small bones into proper position. Our toes are rather useless things; in a way it is unfortunate that we do not have more use for them; certain muscles connected with them are very important to the strength of the arch. Those muscles, for instance, which curl the toes downward pass under the foot, and would help much in holding up the arch if they were not in most cases weak and undeveloped. Again, by twisting the forward part of the foot inward, we push the arch up strongly, but our habit of twisting the foot out—of "toeing out"—and bulging out and pressing down the inner side of the foot, stretches and weakens the set of muscles whose duty it is to pull the small bones upward and inward. The following exercises will help in developing these neglected muscles, and in keeping foot and ankle flexible.

FIG. 24

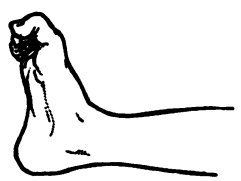


FIG. 25

V. POSITION—On the back, with the legs stretched down.

EXERCISE (*a*) Stretch the foot down strongly, *i. e.*, point the toe, and curl all the toes under as you do so. (Fig. 24.) Relax and repeat.

(*b*) Bend the foot up as close to the leg as possible, and curl the toes under. (Fig. 25.)

VI. POSITION—On the back, one knee drawn up a little and the other resting over it.

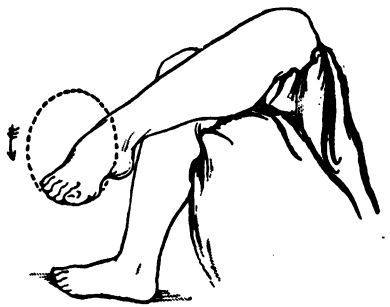


FIG. 26

EXERCISE—Circle the foot, as it hangs, putting the greatest force into the downward and inward movement. (Fig. 26.)

These foot movements, stretching, bending, and circling, can be taken quite well while one is sitting and sewing, or even when one is riding in a train; but they can of course be done to better advantage if the foot is free from its hampering shoe, and done best of all with the bare foot. To practise picking up objects with the toes is also a good way of strengthening the foot, and an exercise not infrequently given for this purpose. The foot may cramp in any of these exercises; the only way to prevent this is not to stretch too hard, nor curl the toes

too tight at first, but to get used to the movements by degrees.

VII. POSITION—Lie face downward, stretched at full length on the floor, the hands folded comfortably under the chin, elbows out.

EXERCISE—*1st Count*—Fling the heels up and back

FIG. 27

as far as they will go, even until they touch the body. (Fig. 27.)

2nd Count—Touch the toes to the floor again, pressing down with them, at the same time forcing the knees up a little from the floor, just enough to stretch well the

FIG. 28

ligaments behind the knees. (Fig. 28.) Do not try to raise the hips; it is only at the knees that we want the stretch. Take the exercise from six to eight times, rather rapidly.

The following movement is meant to strengthen muscles at the back of the neck and shoulders

which help us to keep the head drawn back and the chest up; for a *flat chest* often comes from weakness of these muscles and the habit of carrying the head forward. The custom of going without a hat in the sunshine, or of wearing one on the back of the head, so that it is necessary to drop the head forward in order to protect the eyes from glare or to keep the hat on in a breeze, gives many a girl an ugly and awkward carriage of the head; nor does it stop here, for, just as we have seen that the wrong use of the foot affects the action of the joints above, so does faulty carriage of the head, a curving forward of the vertebræ of the neck, throw out of normal position the joints of the rest of the spinal column below, spoiling the carriage of the whole body. Wearing the hair low often has the same effect.

VIII. POSITION—Lie at full length, face downward, as in the last exercise.

FIG. 29

EXERCISE—Press down with the arms as they lie loosely folded under the chest and force the neck back, being careful to keep the chin well drawn in—*i. e.*, do

not tilt the head back. (Fig. 29.) Drop down to position again and relax. Do this six to eight times.

Note.—This movement should never be felt farther down than just below the shoulder-blades. If you do feel it in the middle of the back, it is probably because you are lifting the *body* from the floor instead of merely pushing back the head and neck.

IX. POSITION—On the knees and elbows, in what is known as the "knee-elbow" position. Do not rest the body back upon the heels, and always keep the knees about fourteen or sixteen inches from the elbows.

FIG. 30

EXERCISE—Hump the back up as high as you can, and then let it slump down completely before humping again. Do this from six to ten times. (Fig. 30.)

If the back has a dull or nervous ache from sitting long over some task, get down on the floor and squeeze out the ache with this last exercise. The blood is apt to settle, when we hold any one position for a long time, and a little contracting of the muscles drives it on its way again and drives out weariness at the same

time. (See Chap. I, "Muscles as aids to circulation.") The stretching in this exercise frees the circulation in the back, the humping is primarily for the development of abdominal muscles; while the knee-elbow position is itself an important position of rest. (See Chap. III, "Quadruped position.")

CHAPTER V

SECOND GROUP OF MAT EXERCISES

THE exercises in this group are of the same nature as those in the last, but a little heavier. Take them up gradually, do each new exercise only two or three times at first, and remember that any jerking, or holding of the breath, or sudden tightening of the abdominal muscles, means that you are not yet ready for the exercise. Give it up and go back to a simpler one which will prepare you for this.

Be sure of taking a moment of complete relaxation between movements—that is, after returning to the starting position, let go of foot, leg, or abdominal muscles as though they were not to be used again. There is always a tendency to keep the muscles tense and ready to repeat the action, but to exercise so is fatiguing and wasteful of nervous force. The lesson of relaxation, learned in this way by constant attention to it, is quite as important as learning the exercise—it is only another form of muscle control.

From now on, in every exercise where the

knee is bent upward, or the leg extended in any direction, a very important part of the exercise

FIG. 24

is the movement of the foot. *Always point the toe* strongly, as in the special exercise for the foot. (Fig. 24.)

I. POSITION—On the back, *the legs stretched down.*

EXERCISE—(*a*) Bend the knee up toward the chest, then stretch the leg down to position and relax it. (Fig. 31.) If you find yourself holding the breath, or feel that the leg is pretty heavy as it returns to position,

FIG. 31

touch the heel to the floor and *slide* it to position. Take the movement six times with each leg.

(*b*) *1st Count*—Bend the knee up as before. (Fig. 31.)

2nd Count—From this bent-knee position, stretch the

leg up, making a straight line to the tip of the toes. (Fig. 32.)

3rd Count—Bend the knee again.

4th Count—Stretch the leg back to position on the floor.

FIG. 32

The position of the leg in the second count is important. (Compare Chap. I, "Normal and abnormal position of base," and Chap. III, "Abnormal and ungraceful walk.") If you find that you cannot straighten out the knee entirely, drop the leg a little from the vertical to a point where it is straight, but stretch the ligaments behind the knee, each day forcing the leg up higher. Always keep the toe pointed. (Fig. 33*a* shows the right, and 33*b* the wrong way.)

FIG. 33a

FIG. 33b

After several months you may take the

following exercise instead of (*b*), although there is nothing to be gained by the substitution if you feel the slightest strain on the *3rd Count.*

(*c*) *1st and 2d counts* as in (*b*).

3rd Count—Lower the leg from the vertical position straight down to the floor without bending the knee, and relax. Make this a rapid motion until you can drop the leg slowly without the quiver of the abdominal muscles or any feeling of strain.

II. POSITION—On the back, with the legs stretched down.

EXERCISE—(*a*) Take the same stretching and breathing exercise as under III (*a*) and (*b*), Beginner's Group,

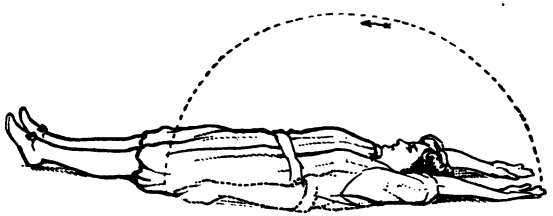


FIG. 34

making this difference, that you reach down with the toes at the same time that you are reaching up with the finger-tips. (Fig. 34.)

All stretching and breathing exercises are beneficial for those who suffer from a hot head and cold feet, from sleeplessness or nervous fatigue, and may well be taken on going to bed at night. Stretching is Nature's way of

relaxing muscles, relieving congestion, and equalizing the circulation. Many women have a prejudice against stretching—an idea that it will do them some mysterious harm, but as a matter of fact the harm usually comes with *perfunctory reaching*, as, for instance, when a woman, compressed and hampered by belts and corsets, or weakened by the wearing of them, struggles to reach some shelf, or the top of a window just a little too high for her. Duty and necessity often carry us beyond the point at which we would naturally stop, if we were doing things merely from our own sense of pleasure or comfort. This, together with the fact of suitable costume, gradual training, and preparation, explains to some extent why a woman can take swinging, hanging, and stretching exercises in a gymnasium, and be the better for them, when she cannot do similar things about a house.

POSITION—(*b*) Still on the back, but with the knees drawn up a little, if more comfortable; the hands on the ribs above the waist-line (in the region of the 9th and 10th ribs), the finger-tips together.

EXERCISE—Take in a full breath and try to force the finger-tips apart. This time have as little motion as possible in the upper chest. (Never hold the breath in any of the breathing exercises.) Expand in this way from six to ten times.

We need to learn to use the whole chest in breathing. Too few women make sufficient use of the lower part of the chest, or have that breadth of angle below the breast-bone and between the ribs in front (see Fig. 35a), which is a sign of strength and endurance. The narrow

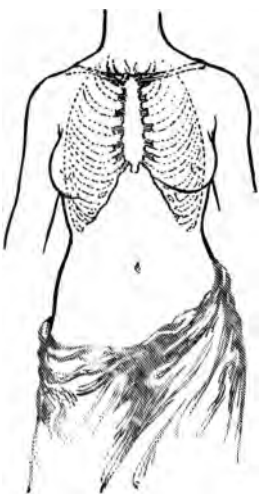


FIG. 35a

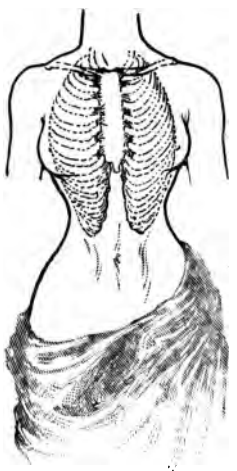


FIG. 35b

angle (Fig. 35b) betokens alike limited action of the diaphragm and limited oxygen supply. Various "systems" of gymnastics often boast of ability to develop extraordinary power of chest expansion, but, while the flexibility of the chest walls is important, we should aim es-

pecially at an *habitually* large and expanded chest and the *habit* of full breathing. The power "to expand eight inches" is not of much help to any one who uses it only for occasional exhibition, and it is a question whether such power is of any practical use in ordinary life. Over-development is a source of danger and may be followed by disease.

III. POSITION—On the back, with the legs stretched down.

EXERCISE—(*a*) Lift the left leg high and carry it across the body, touching the toe to the floor on the right side. (Keep the knee straight and the toe pointed.) At the same time, reach back with the left arm on the floor, making an oblique stretch across the body from the

FIG. 36

finger-tips to the toes, and take in a long breath. The shoulders hardly move from their position on the floor. (Fig. 36.) Take the exercise six times with the left arm and leg, and then as many times with the right.

(*b*) Take the same leg movement, but reach this time with *both* arms to the left as the left toe touches the floor on the right—and vice versa.

IV. POSITION—Sit on the floor, the legs straight out in front, the toes stretched down, the hee s about two feet apart. Let some one kneel down at your feet and grasp the toes on the inner side.

EXERCISE—Against the steady but moderate resistance of the hands on the toes, bend the feet toward each other until they almost meet, twisting them inward strongly at the end of the movement, so that you have the feeling of tightening and drawing up the arch.

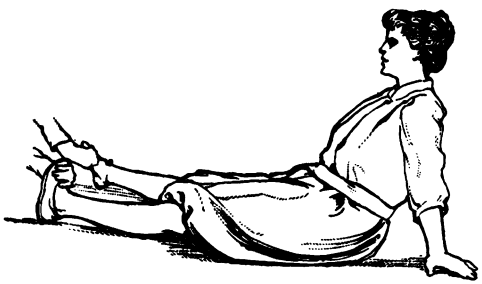


FIG. 37

(Fig. 37.) The heels remain in place. Fix your attention on the movement in the foot and ankle, and avoid as much as possible the inward twisting of the leg and thigh. The person who resists must never press so hard against the feet as to cause the pupil to feel any strain in the abdomen. It is enough to take the exercise six successive times; repeat it if you want to do so after doing some other exercise.

V. POSITION—Sit on the floor, the legs straight out in front, the *heels together*. Let a second person grasp the toes firmly, this time with the pressure on the top, or front.

EXERCISE—Against steady but moderate resistance, bend the foot up as close to the leg as possible (Fig.

FIG. 38

38), curling the toes under. (See Fig. 25.) Do this from six to eight times.

The following exercise gives an idea of the movements used in swimming on the back.

VI. POSITION—(*a*) On the back with the legs stretched down.

EXERCISE—*1st Count*—Bend both knees out sideways

FIG. 39

close to the floor, drawing the feet up sole to sole. (Fig. 39.)

2nd Count—Stretch both legs out obliquely on the floor, sliding the heels. (Fig. 40.)

3rd Count—Slide the legs together. Take the whole exercise six times.

FIG. 40

Note.—Five or ten minutes of rest in the position shown in Figure 39 often relieves congestion or a weary, draggy feeling in the abdomen.

After becoming accustomed to the leg movements, combine them with the arm movements in the following way:

POSITION—(*b*) On the back, as before, but with the hands resting on the upper chest.

EXERCISE—*1st Count*—As you bend the knees out, throw the hands from the chest to the floor above the head, the fingers together and straight, the hands back to back.

2nd and 3rd Count—As the legs are stretching out obliquely and coming to position, separate the arms, bringing them slowly down to the sides. Just before bending the knees for the next stroke, bring the hands quickly from the sides back to position on the chest.

VII. POSITION—On the back with the knees drawn up, the soles of the feet on the floor.

EXERCISE—From this position, raise the hips until there is a straight incline from neck to knees. (Fig. 41.) *Do not hold the position*, and relax thoroughly

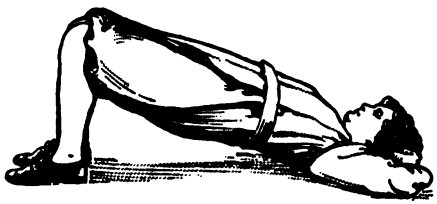


FIG. 41

before repeating. Take the exercise from three to eight times, limiting yourself to three or four times for a few weeks if there is any feeling of strain or tendency to hold the breath.

VIII. POSITION—Lying face downward, the hands crossed under the chin.

EXERCISE—(*a*) Force the neck back as before, in VIII, Beginner's Group. As the neck is pushed back, however, draw the hands apart until the fingers touch

FIG. 42

the ball of the shoulders, and the elbows are straight out on a line with the shoulders. (Fig. 42.) Try to get the shoulder-blades together. Be especially careful in this case not to get the bend in the middle back,

as this is apt to bring strain in the abdomen. *Do not hold the position*, but relax again immediately after taking it and take the exercise only three or four times in succession.

When VIII (*a*) has become so easy that in doing it you can breathe in and out freely, then—

(*b*) Fling the arms sideways to their full length, as the neck is pushed back, and be particularly careful about the middle back. (Fig. 42, dotted lines.)

These two exercises are stronger forms of VIII, Beginner's Group. If you have developed a lump of fat on the back of the neck through disuse of the muscles (the result of habitually dropping the head forward), take all of these neck exercises freely. It is not necessary to lie down to take them. If you find yourself with the chin and chest dropped over book or sewing, immediately force the neck back (keeping the chin in), and push up the top of the head—in other words have the feeling of arching the neck like a fine horse, and arch it eight or ten times. But be very careful not to hollow the back at the waist-line while doing this, or while pushing the elbows back as in VIII (*a*) and (*b*). These shoulder and neck muscles are always lazy and ready to let any

other muscles do their work. If the chest is thrown well forward as the neck is arched, there will not be so much danger of hollowing the back.

IX. POSITION—Lying face downward, the hands folded under the chin as before.

EXERCISE—Lift the left leg high, without any bend in the knee, and touch the toe to the floor on the right

FIG. 43

side. The elbows remain in position on the floor. (Fig. 43.) Take the movement six times with each leg.

X. POSITION—On the knees and elbows. (See Fig. 16.)

EXERCISE—(*a*) Extend the leg backward on the floor until the body comes in contact with the other heel. (Fig. 44.) Bring the knee completely back to position each time. Take the exercise six to eight successive times with each leg, or alternately, if you prefer it.

When X (*a*) has been so well learned that the leg is always *completely* extended and returned, try the following combination of right and left alternate movements. It is one of the best exercises for stirring up the liver and bowels, but if carelessly done,

i. e., if the leg is not completely extended and returned and the rolling not taken at the proper time, it is worthless.

(*b*) *1st Count*—Extend the left leg on the floor until

FIG. 44

the body comes in contact with the right heel as in X (*a*). (Fig. 44.)

FIG. 45

2nd Count—Roll just enough to the left side to allow you to extend the right leg on the floor. (Fig. 45.)

FIG. 46

3rd Count—Roll enough to the right side to be able to draw the left knee up to position again. (Fig. 46.)

4th Count—Roll up on the left knee and draw the right knee back to position. You should now be in the knee-elbow position again.

Do the exercise slowly for some time until you have it accurately, then take it more rapidly, merging the movements. It is well to begin with the right leg and take the exercise through four or five times, then to take it the same number of times starting with the left leg.

XI. POSITION—On the knees and elbows, the head held on a level with the shoulders.

EXERCISE—(*a*) Stretch the leg up as high as it will go. Avoid any sagging at the hip, or bending of the knee.

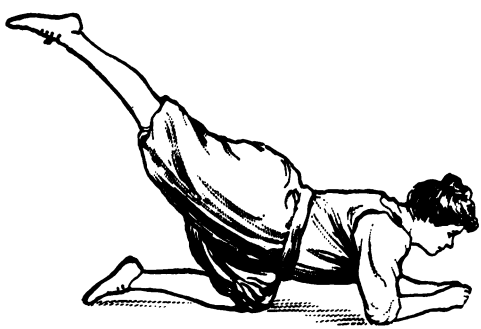


FIG. 47

The heel should be much higher than the shoulders. (Fig. 47.) Bring the knee completely back to position each time, not half way back. Take the exercise from six to ten times with each leg, or alternate the right and left if you prefer it.

(*b*) Stretch the left leg up as far as possible, at the same time reaching up and forward close to the head

with the left arm. (Fig. 48.) Take the exercise with a yawn and the pleasurable sense of "a good stretch." The balance is often difficult to maintain at first, but

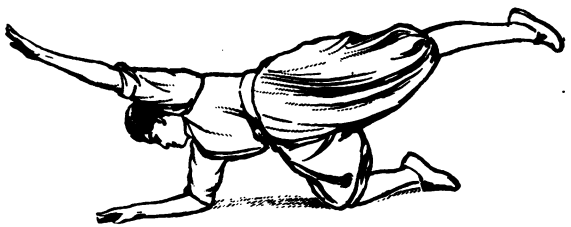


FIG. 48.

daily becomes easier. Again be sure that you are not holding the breath. Take the exercise six to eight times, alternating sides. (Fig. 48.)

CHAPTER VI

THIRD GROUP OF MAT EXERCISES

THE exercises of this group are more advanced than those given in the preceding chapter. Therefore, be moderate at first in taking them up, and keep in mind the cautions given with the earlier groups. Remember that the leg, when used at full length in a movement, must have the knee straight and the toe pointed. Don't be weak-kneed!

Breathing movements should, as usual, be interspersed throughout the group.

I. POSITION—On the back, the legs stretched down.

EXERCISE—Raise the left leg straight up as high as it will go without any bend at the knee; then force it up a little straighter for an instant, just to stretch the tight ligaments behind the knee, and lower it again quickly, but lightly to position. (Fig. 49.) Take the exercise six times with each leg.

This exercise uses important internal abdominal muscles both on the upward and downward movement.

The two following exercises, II (*a*) and (*b*), like others which we have had with knee-bending, improve the tone of the internal

abdominal muscles and organs, and help abdominal circulation. They also develop that important external muscle which runs straight

FIG. 49

up the front of the trunk to the breast-bone, giving support to the abdominal organs.

II. POSITION—(*a*) Lie at full length on the back with the arms down close to the body, and press firmly on the floor with hands and forearms as you bend the knees.

EXERCISE—Bend *both* knees up as far as possible toward the chin, so far that the lower part of the back comes up off the floor with the effort to get the knees up. (Fig. 50.) Drop the legs back to position with control, not slowly, but without slamming them down. Do the exercise about six times. When it has become

FIG. 50

easy, after a month or so perhaps, take (*b*) as well, or in its stead.

POSITION—(*b*) Sit up with the knees bent slightly,

FIG. 51

the hands close to the side and pressed on the floor. (Fig. 51.)

EXERCISE—Sway the body forward a little, then roll quickly backward until the toes touch the floor beyond the head. (Fig. 52.) If you cannot touch, do not

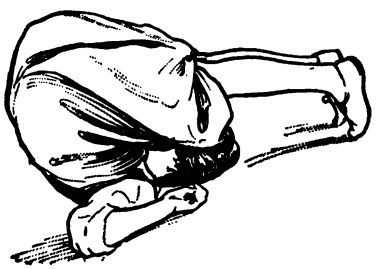


FIG. 52

strain to do it, but come as near touching as you can comfortably. Return to position immediately. Take

the exercise three or four times at first. Later, if you enjoy it, take it ten or fifteen times, humming mentally a waltz for rhythm, accenting well and giving two measures for going backward, one to the return, and one to the pause before starting again.

The next exercise is merely a repetition of the movements in IV (*b*), Beginner's Group, made heavier, however, by the use of both legs together.

III. POSITION—Full length on the back.

EXERCISE—*1st Count*—Bend the knees out, each to its own side, keeping them as wide apart and as close to the floor as possible *without strain*, and drawing the feet up sole to sole. (See Fig. 39.)

2nd Count—From that position raise the knees until they come together, and the soles of the feet are flat on the floor.

3rd Count—Stretch the legs down again on the floor to position. Take the movement as a whole from four to six times.

IV. POSITION—Lying full length on the back, the feet caught firmly under a short strap attached to the base-board of the room, or caught under the edge of the bureau (if it is low enough), or held steadily by a second person.

EXERCISE—With the chin held in, the neck and head well back on the shoulders, the chest forward, and the toes pulling strongly against the strap, come up to a sitting position, making yourself as tall and straight as possible. (Fig. 53.) The knees bend a little of necessity at the finish. So long as there is a sense of unusual effort, in getting up, help yourself by pressing

down on the floor with hands and elbows. Drop back again after sitting up, and relax every muscle as though

FIG. 53

the exercise were not to be repeated. Do this from four to six times.

This is a strong exercise, for much the same muscles as those used in II (*a*) and (*b*). It is often foolishly done as an exhibition of strength, without having the feet held down, and without using the hands, but it is doubtful whether there is anything to be gained by taking the exercise in this way, and it may easily cause internal strain. It will be a long time before the average woman should even attempt to get up without the help of her hands and elbows. Exercises such as we are taking are meant to strengthen, but are not to be considered tests of strength. One person's mus-

cular development and strength should never, except in a most general way, be taken as the standard of strength for another. Aim at an increased sense of well-being and at better endurance rather than at the muscular development and skill of a contortionist or trained gymnast.

V. POSITION—Again on the back, with the legs stretched down.

EXERCISE—*Breathing.* Reach up above the head with one arm and down with the other, at the same time stretching down with the toes, taking in a deep breath, and yawning if you feel inclined. Take the exercise about six or eight times, alternating the arm movements.

VI. POSITION—On the back, the knees drawn up a little, the soles of the feet resting on the floor. See position of legs in Figure 22.

EXERCISE—*1st Count*—Drop the knees down to the left without raising the shoulders from the floor. (Fig. 20.)

2nd Count—From this half-side-lying position draw the knees up as close to the chest as possible.

3rd Count—Lift the knees, swing them across close to the chest (the feet are now well off the floor), and drop them on the right side.

4th Count—Slide the feet back and raise the knees to starting position.

After having learned the positions in four counts, merge the movements into a circling of the knees. (Fig. 62, Appendix.) Take the circle six times, starting

toward the left; then as many times beginning the movement toward the right.

The latter exercise, like II and IV, uses the "straight-front" muscles as well as the internal abdominal muscles. In the side movement it brings into play another set called the oblique muscles, which, like the others, are usually weak in women. Aside from developing the muscles, it is valuable for the kneading which it gives to the bowels and liver.

VII. POSITION—Lying on the back, the legs stretched down.

EXERCISE—(*a*) Leg circling thus—move the left leg out to the left on the floor as far as it will go, then raise

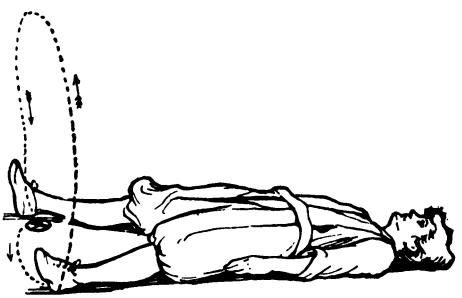


FIG. 54

it and carry it high across the body to the right side, then lower and return it to position. (Fig. 54.) There must be no bend in the knee or ankle, but as straight a line as possible from the hip to the tip of the toes.

Circle the right leg in the same manner, first out to the right along the floor, then up, across to the left and down. Take the movement first with one leg, and then with the other, making free circles in the air from four to six times.

Note.—It is very necessary to observe the rule of completely relaxing after each circle, otherwise the muscles of the abdomen will be in a state of constant contraction, which is not desirable.

(*b*) Reverse the direction of the circle in VII (*a*) thus: Carry the left leg across the body toward the

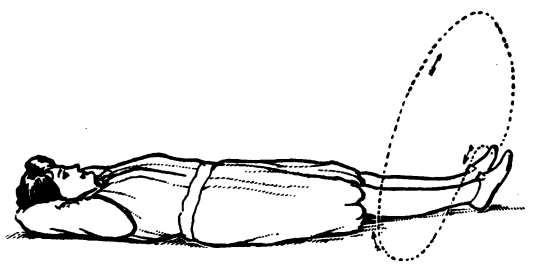


FIG. 55

right, lift it and carry it well out to the left side, keeping it high, then lower and return it to position. (Fig. 55.) As before, have no bend in the knee and ankle. In the same way, circle the left leg, beginning by carrying it across the body toward the right. Relax before repeating the exercise.

Most women have a tendency to put on useless flesh about the hips and thighs. When once the process begins, it goes on rapidly,

because the heavier a woman grows, the less inclined she is to take any sort of exercise; it becomes an effort even to walk. Yet mere walking, if done with a free swing of the leg from the hip, calls into use the muscles about the hips and turns fat into good, firm tissue.

Walking has been described as *a series of falls.* As the body-weight moves forward, we roll to the ball and off the toe of one foot * while the other foot is receiving the weight, and as we roll to the toe, the whole leg is straightened and the hip muscles come into play. But many of us in walking reverse this action, for unless the chest is carried high and well forward, the body does not fall forward, but hangs heavily back on the rear foot, and there is no rolling up to the toe nor straightening of the leg—just a springless lifting up and putting down of the foot, with little action above the knees.

The high heels and narrow skirts of the period so hamper the normal action of the foot and leg that the mode has resulted in a weak-kneed

* Walking on the ball of the foot has often been misinterpreted to mean touching the ball first. While a few minutes of gymnastic practise in such walking helps to strengthen the foot, and occasional walking on the toes, wherever one may be, is recommended as a rest to the feet, to walk habitually in this manner is not normal, and results in a stilted, jarring step. Touch the heel first, but do not linger on it; lift it at once and roll to the ball of the foot.

"glide" in which the constantly bent knees are a conspicuous point of the figure.

Stair climbing, which might be used to advantage as a developing exercise, is done with body bent, chest contracted, breathing hampered, internal organs crowded down, the leg lifted wearily from step to step; not once in the whole breathless effort, from the bottom of the stairway to the top, is the leg completely straightened or the spinal column brought into normal position.

In all the leg-swinging and leg-stretching exercises which we have learned, we are making an effort to do artificially much that could be done naturally, if we were more normally dressed and had better knowledge of how to use our bodies.

VIII. POSITION—Lie stretched on the left side, the left arm under the head, the right hand on the floor for balance, the right leg resting on the left, the knees and ankles without bend. The head and heels should really be stretched somewhat backward, making the body over-straight as it lies.

EXERCISE—Raise and lower the right leg (knee and ankle straight, as usual in all such movements) six to eight times. (Fig. 56.) Then turn over to the right side, get into careful position again, and raise and lower the left leg.

IX. POSITION—Lying on the left side as before.

EXERCISE—Circle the right arm forward, up past the head, backward, and down to position. Inhale as the arm moves forward and up, and exhale as it moves back-

FIG. 56

ward and down to the side. Take this six or eight times on each side.

X. POSITION—The same as in VIII, on the left side, the left arm under the head, and the right hand on the floor to help keep the balance.

EXERCISE—*1st Count*—Draw the right knee up in

FIG. 57

front of the body toward the chest, letting it touch the floor. (Fig. 57.)

2nd Count—From this position stretch the leg directly forward on the floor.

3rd Count—Slide the leg back to position. After having taken the exercise as a whole from four to six times, roll over to position on the right side, and repeat with the left leg.

XI. POSITION—Again stretched on the left side, maintaining the balance with the right hand. It is particularly necessary in this exercise to have the head and heels stretched well back. The legs are kept straight and do not change position throughout.

EXERCISE—With a sharp side-bend at the waist-line, raise yourself quickly as though to look at something, helping yourself up with both hands and supporting

FIG. 58

yourself for a moment. Stretch up with the head and neck and the whole spinal column. (Fig. 58.) This is purely a side movement, and you should not find yourself in a sitting position, but resting entirely on the hip and the side of the leg. Return to position and rest. Four or five times on each side are enough for this movement.

Such side-bending as is given in the latter exercise is good for sluggish livers and bowels.

XII. POSITION—On knees and elbows.

EXERCISE—Drop the hips down to the left side, return to position and drop them down to the right; the knees, forearms, and toes should hardly move from place.

FIG. 59

(Fig. 59.) If the exercise is done rapidly, there is a tendency for the knees to move farther and farther from the elbows; keep them in place. Do this six to eight times, alternating sides.

XIII. POSITION—On knees and elbows.

EXERCISE (*a*) *1st Count*—Stretch the right leg back (the toe on the floor) as far as it will go *without moving the body backward* (not as far as in Fig. 44, where the thigh rests on the leg).

2nd Count—Raise the leg from that position as high as it will go (Fig. 47), avoiding as before any sagging at the hip or bending of the knee.

3rd Count—Bend the knee back to position. Go through the exercise from six to eight times with each leg with a rather rapid count.

Exercise XIII (*a*), as also the two variations of it (*b*) and (*c*) which follow, should be practised daily and several times a day to reduce the hips; (*b*) should, however, be taken only after practise in (*a*) has made that easy, and (*c*) only after (*b*) has ceased to require much conscious effort.

(*b*) Begin exactly as in XIII (*a*), taking the first two counts; but instead of bending the knee back to position on the 3rd count, simply lower the leg until the toe touches the floor again, and then, on a 4th count, bend the knee back to position.

(*c*) Take the knee-elbow position again.

1st Count—Stretch the left leg back *without moving the body backward* (exactly as in the 1st count of XIII (*a*)).

2nd Count—Lift the leg high (no bend in knee or

FIG. 60

ankle), carry it across as far to the right side as possible, and touch the toe to the floor. (Fig. 60.)

3rd Count—Raise the leg high, swing it back to the left side again as far as it will go, and touch the toe to the floor.

4th Count—Raise it high again, carry it once more to the right side and touch.

5th Count—Raise the leg and swing it back to the first position (knee-elbow position), of course bending the knee.

XIV. POSITION—Standing erect.

EXERCISE—*1st Count*—Squat, with knees spread apart, and place the hands on the floor in front of you, near enough for the elbows to touch the knees.

2nd Count—Stretch the leg back as far as it will go without moving the body backward at all, and touch the toe to the floor (Fig. 61).

3rd Count—Bend the knee again. Repeat the 2nd and 3rd counts several times in succession, careful to

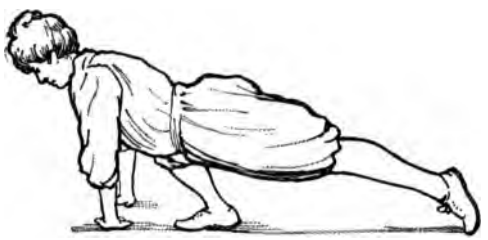


FIG. 61

maintain an even slant from shoulder to heel, with neither sagging down nor humping up of the hips and no bending nor dragging of the knee.

4th Count—Stand erect.

Stoop again and take the same exercise twice with the right leg. Or, do the movement once with the right and once with the left, and return to standing position.

APPENDIX

APPENDIX

I. MAT-WORK

FOREWORD TO TEACHERS

THE physical examiner in any girls' school or college finds lack of abdominal development one of the most common defects, a weakness the more conspicuous when a comparison is made between boys and girls of the same age. The physician also finds a very general abdominal weakness and lack of tone among women, to which may be attributed directly or indirectly many of their troubles. The physician goes back to fundamentals. In most books on the treatment of pelvic disorders, the quadruped positions ("knee-elbow" and "knee-chest") and exercises in these positions are suggested as valuable helps. These positions and exercises are fundamental, for just as in the evolution of the human body the trunk precedes the limbs in order of development, so the quadruped positions precede the upright.

In the average gymnasium, however, the greater proportion of the movements given are for

the less fundamental parts, for arms and legs. The reason for this may be that good abdominal exercises for mass drills are not easy to find in any variety, and women rarely reach a point of development and coordination sufficient to enable them to do profitably the exercises and tricks on apparatus that bring so largely into play the muscles of the trunk. The following collection of mat exercises may help to meet the need for trunk exercises.

MEMORANDA

1st. There should be no jerking or sudden setting of the abdominal muscles.

2nd. There should always be a moment of *complete relaxation* between the movements; that is, after return to position.

3rd. There is no need to hurry on to new exercises; the simple ones are always good. Any sudden setting of muscles or drawn look about the face, or holding of the breath, means that an individual is not ready for a given exercise.

4th. In the knee-elbow position the knees and elbows should be at such a distance that the arms and thighs are at right angles to the body—from 14 to 16 inches apart. (See Fig. 16.)

5th. The fourth group is made up of heavy exercises, which are however of no greater value than the preceding ones, except to those who are muscularly ready for them. It should not be used as a whole and the individual

exercises should be taken only when they can be done with free breathing and a sense of power rather than with a feeling of great effort.

6th. Pupils should be encouraged to make up their own exercises, to find movements and positions which peculiarly rest and satisfy them.

7th. Teachers are advised not to use music for this abdominal work, until the positions at every point are accurately taken, and then only if the class naturally and easily keeps together. What one will take easily and quickly, another will take with great effort and strain at the same rhythm. If after the pupils are trained, they keep the same rhythm without effort, some well-adapted waltz music will add to the pleasure of certain movements.

BEGINNER'S GROUP

Supine-lying—1. POSITION—Both knees half bent, feet on mat. Bend knee up to chest, six times. (Fig. 18.)

2. POSITION—As in 1. Drop knee down sideways as far as it will go without strain, keeping foot in place, six times. (Fig. 19.)

3. POSITION—As in 1. Deep breathing, raising arms forward and up with inhaling, bringing them down sideways with exhaling, or raise and return them sideways. (Fig. 22.)

4. POSITION—Legs stretched on mat. Bend knee sideways on mat until sole of foot is parallel to the other leg, six times. (Fig. 23.)

NOTE.—The grouping of the exercises is slightly different from that used in the body of the book, but the cuts belonging to the exercises will be easily found by their numbers.

Progression (*a*) Bend knee sideways, stretch leg obliquely out on mat, and slide to position, in 3 counts. (Fig. 23, dotted lines.) Take six times.

Progression (*b*) Bend knee sideways, raise knee to half-bent position, and stretch to position, in three counts. Take six times.

5. POSITION—Stretched at full length on mat. I. Stretch foot down—pointing toe. Also stretch foot down and curl toes under. (Fig. 24.) II. Bend foot up as close as possible to leg (dorsal flexion), at the same time curling toes under. (Fig. 25.)

POSITION—One knee crossed over the other. III. Foot circling—emphasis on downward and inward movement. (Fig. 26.)

Sitting—6. POSITION—Legs stretched on mat, heels about 2 feet apart. Turn toes in, twisting foot inward at end of movement in such way as to draw the arch up as much as possible; heels remain in place. This exercise is taken against resistance, the inward effort of the feet resisted by an outward pull, a second person grasping the forward part of the feet firmly. (Fig. 37.)

7. POSITION—Legs stretched on mat, feet together. Turn toes up (dorsal flexion of the foot) as far as possible against resistance. (Fig. 38.)

Prone-lying—8. Alternately bend and stretch both knees. (Figs. 27–28.) (In stretching, the toes are pressed upon the floor and the knees pressed up a little from the floor.)

9. POSITION—Hands folded comfortably under chin, elbows out. Press arms down and force neck back, chin in. (Fig. 29.)

Caution—This action should never be felt in the middle

back, not farther down than between the shoulder blades. Do not raise the body from the mat.

Progression—Force neck back, at the same time draw hands apart and elbows out and back in such a way as to force the shoulder-blades together. (Fig. 42.)

Knee-elbow position—10. Force back up at waist-line, relaxing fully after each movement. (Fig. 30.)

SECOND GROUP

Supine-lying—1. Bend knee to chest. (Fig. 31.)

Progression (*a*) Bend knee, stretch leg to vertical, bend and stretch to position, four counts. (Fig. 32.)

Progression (*b*) Bend knee, stretch to vertical, and lower leg to position in three counts.

2. I. Hands on ribs in ninth rib region, inhale, forcing hands apart. II. Hands on upper chest; localize action here.

3. Touch L. toe to mat on R. side, swinging leg high across, keeping shoulders flat on mat. Take the exercise with a pleasant sense of reaching and stretching. Reach back obliquely with L. hand as the leg is swung across, adding to the stretch. Keep knee straight and ankle extended. (Fig. 36.)

Progression—Increase the stretch and the twist of the trunk by reaching with *both arms* toward the left as L. foot swings over to R. side.

4. Bend both knees sideways, each to its own side (Fig. 39), stretch legs out obliquely on mat (Fig. 40), and slide to position in three counts. (Swimming movements.)

Progression—As the knees are bending, throw the arms from the middle of the chest to above the head with

fingers straight; on the second count, as the legs are stretching, begin to separate the arms and bring them to the sides; on latter part of third count, after the legs are in position and just before the knees are beginning to bend, bring arms back to chest.

5. POSITION—Knees half bent, soles of feet on mat. Raise and lower hips. (Fig. 41.)

Prone-lying—6. POSITION—Hands folded under chin, elbows out. Force neck back, fling arms out sideways, forcing the shoulder-blades together. (Fig. 42, dotted lines.)

7. POSITION—As in 6. Swing leg up and back across the body and touch L. toe to mat on R. side. Keep knee straight and ankle extended. (Fig. 43.)

Knee-elbow position—8. Extend leg up and back. (Fig. 47.)

Progression—Extend arm forward and leg up and back, *reaching* as far as possible with foot and hand. Take with a yawn and the pleasurable sense of a "good stretch." (Fig. 48.)

9. Extend leg back on mat until the body touches the other heel. (Fig. 44.)

Progression—Extend L. leg as far as possible (as in 9), roll a little to left, at the same time extending R. leg (Fig. 45); roll to right and bend L. knee (Fig. 46); get up on to L. knee and bend R. knee, coming thus to the starting position, in four counts.

THIRD GROUP

Supine-lying—1. Bend both knees upward, tipping the pelvis up at the end of the movement. Aid the movement by pressing the hands on the mat. (Fig. 50.)

Progression—POSITION—Sitting with knees slightly bent (Fig. 51). Roll back, touching toes to mat behind head. (Fig. 52.)

2. POSITION—Knees half bent, soles of feet on the mat. Drop both knees to the same side. (Fig. 20.)

Progression—Drop both knees to the same side; then, keeping feet in place, stretch down with knees until the body rolls up on to the hip. (Fig. 21.)

3. Bend knees sideways on mat, each to its own side (Fig. 39); then keeping feet in place on mat raise knees; extend legs to position, in three counts.

4. With ankles held firmly down by a second person, or toes held by straps, come to a sitting posture *with upper chest leading and chin in.* It is best to press with the hands on the mat about on a line with the hips until this exercise has become easy by continued practise. (Fig. 53.)

5. Reach up above the head with one arm and down with the other, at the same time stretching the whole body, taking in a full breath and yawning.

6. With leg extended, circle out, up, across and down. (Fig. 54.) Then circle across, up, out, and down. Keep knee straight and ankle extended.

Side-lying—7. POSITION—Legs and head stretched a little back, so that the body is slightly curved, one arm under the head. Raise leg, keeping knee and ankle extended. (Fig. 56.)

8. POSITION—Same as in 7, with hand on mat in front helping balance. Bend the upper knee forward, stretch forward, slide leg back to position, with knee straight, ankle extended, in three counts. (Fig. 57.)

9. POSITION—Same as above. Raise trunk (side-bend), helping with hands. (Fig. 58.)

10. POSITION—Same as in 7. Deep breathing, circling the free arm forward, up, back, and to position.

Knee-elbow position—11. Drop hips to mat alternately to right and to left, keeping toes, knees, and elbows practically in place. (Fig. 59.)

12. Extend leg on mat, raise high (Fig. 47), bend to position, in three counts.

Progression—(*a*) Extend leg, raise, lower, and bend to position, in four counts. (b) Extend leg, touch the toe across, out, across, and bend to position, in five counts. (Fig. 60.)

Note—In these three exercises, *do not move the body back* when extending the leg.

Standing—13. Stoop, placing hands on floor. Extend one leg back four times. Stand. Repeat with other leg. Repeat, extending legs alternately. (Fig. 61.)

FOURTH GROUP

Supine-lying—1. Bend *both* knees to chest, stretch to vertical, lower legs to position. (See Fig. 32—single-leg raising.)

Progression—(*a*) Raise one leg to vertical. (Fig. 49.) (*b*) Raise both legs four times. (See Memoranda.)

Note—Pressing the hands on the mat makes the exercise lighter.

2. Separate legs sideways; rest, and return to position. (Fig. 40.)

Progression—Slight resistance to the return, the hands of the helper on the inner side of the ankles.

3. POSITION—Knees half bent, soles of feet on mat. Circle knees toward the right, then toward the left, lifting feet from mat. (Fig. 62.)

FIG. 62

Progression (*a*) POSITION—*Legs extended.* Draw knees up and circle knees, returning to *straight-leg* position.

Progression (*b*) POSITION—Legs extended on mat. Circle both legs—(to left, up, to right, down; then to

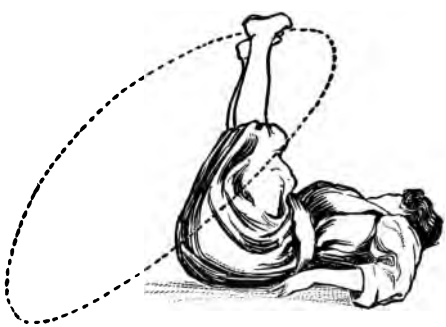


FIG. 63

right, up, to left, down.) (Fig. 63.) Keep knees straight and ankles extended.

Caution—Always *relax* in position after *each* circle.

4. POSITION—Knees half bent, soles of feet on mat. Circle hips. (To left, up, to right, down; then to right, up, to left, down.) (Fig. 41.)

Side-lying—5. POSITION—Head and legs stretched backward so that the body is slightly curved. (*a*) Touch toe of upper leg forward and back. (*b*) Raise

FIG. 64

leg high, swing forward and touch toe to mat, return to position on third count (Fig. 64); or merge the movements into a circle, up and forward, up and back to position—a freer movement in two counts.

Prone-lying—6. Bend both knees until the heels touch the body and extend them again on first count. (Fig.

FIG. 65

27.) On second count, with pressing down of toes and stretching of knees, raise the body, resting on toes and forearms. (Fig. 65.) Do not hold the position.

7. POSITION—Hands pressed on mat close to body about the height of the armpits.

Keeping chin and chest close to mat, push hips up (Fig. 66) and back as far as possible, finishing on knees,

with arms stretched on mat—"Salaam" position. (Fig. 67.) Return to the prone-lying position, keeping chin close to mat.

FIG. 66

FIG. 67

Prone-knee-hand support—8. Spring to toe-hand support. (Fig. 68.) (A straight line from heel to head, the hips neither raised nor lowered.)

FIG. 68

Progression—Take the same exercise from the standing position, in this manner—1st count—Stoop, placing

FIG. 69

FIG. 70

FIG. 71

hands on the floor. 2nd count—Spring to toe-hand support. 3rd count—Return. 4th count—Stand.

Prone-toe-hand support—9. Spring to legs separated. (Fig 69.)

10. Turn to side with arm outstretched, come slowly back to position and turn to other side, the body supported on one hand and foot in the side position. (Fig. 70.)

11. Balance, resting on one hand and the opposite toe, the free arm close to the head, the free leg raised. (Fig. 71.)

II—REVISED CHESTWEIGHT SERIES

FOREWORD TO TEACHERS

THERE seems to be a theory that no American gymnasium is properly equipped without a set of chestweights. I speak of it as a theory, because these machines are actually so little used. When they are, it is too often for a short series of small, localized, nervous movements with no change or progression from day to day.

These exercises have been severely criticized, not only by advocates of the Swedish system, whose principles are opposed to the use of weights, but by others who have not this basis.

I have watched chestweight exercises in various gymnasiums, training schools included, and have found:

1st. The form in which they are taken is usually bad, or, I might say, form is lacking. By this I mean that the position of the body, its balance and the relation of its parts in the various positions, are apparently not considered. The very point, then, of each movement is lost.

2nd. The exercises are usually done in a jerky manner. They lack, in other words, that smoothness which indicates and develops control and coordination.

3rd. There are many small, limited movements for arms and shoulders only, which could be taken to better advantage, and with legitimate saving of energy, when lying on the back at the floor-pulleys. Pectoral contraction also plays a large part.

4th. The movements are repeated to the point of fatigue, so that positions which may be comparatively good in the beginning quickly degenerate.

Chestweight exercises have always seemed to me the very bread and butter of daily gymnastics, and the best simple all-round exercises in the gymnasium, because,

1st. They are the simple means of *teaching the pupil balance, the shifting of body weight, and the maintaining of correct posture in these changes of weight and balance.*

2nd. The chestweight is capable of being used for *large, free body movements* which may be strongly corrective.

3rd. Each contraction is followed by a relaxation resulting from the pull of the weights on the return movement. (Our experience has been that few people know what complete relaxation is. It is a thing which has to be patiently taught and acquired.)

We have developed the following series with reference to high-school and college students. To minimize nervous output, we have first chosen large movements, and, in the second place, made a point of rhythm. To avoid

fatigue, each movement has been alternated with another, using a different set of muscles (approximately); a "rest movement" it might be called. Considering how much the pectoral muscles are used in ordinary daily activity, and how great a part they play in the majority of movements, we have tried to avoid as far as possible any direct use of them.

1. **Count**—All movements under one count are done simultaneously.

2. **Swing**—To avoid jerkiness, make no distinct break between counts. In many cases the counts merge directly the one into the other.

3. **Return Count**—*Return to position after each count.* It has been considered unnecessary to give a count to each return movement, although the teacher may choose to begin so with the class.

4. **Change Position and Repeat**—Repeat the whole exercise as it stands about four times. Then, whenever an exercise begins with R. or L. foot forward, or with R. or L. side to the machine, always reverse the positions and repeat four times more.

5. **Advance**—The exercises in each new series should be taken up gradually, and any exercise which seems too difficult should be, for the time, replaced by one in the same position from a previous series. The pupil's posture is the surest sign of the suitability of the exercise.

6. **Weights**—Light weights are preferable. Position and form should always be the test for increase of weight and should never be sacrificed to the latter.

One pound to begin with, two pounds as a maximum, is a safe average rule.

7. **Outward Rotation of Humerus**—Whenever possible the humerus should be rotated outward. For instance, in swinging the arms down, the palms should always be turned up.

8. **Bowing Position**—In the "bowing position" all the weight is on the rear foot, the rear knee well bent, the forward knee straight, the *trunk relaxed.* (Fig. 8.)

9. A "progression" does not belong to the succession of exercises in the series, but is to be used as a substitute for the original exercise when it has been mastered and a somewhat more complex movement is wanted.

10. The hollowed back and flattened chest are characteristic of the ordinary chestweight drill; therefore in all of these exercises where the arms are swung out or up, the student should make special effort to force the *chest up and forward* and *the middle back out.* Poising to the forward foot insures a better position.

We should keep in mind throughout the chestweight exercises, the buoyant poise of the beautiful Winged Victory of Samothrace.

BEGINNER'S SERIES (WITH ONE HANDLE)

L. side to machine—I. POSITION—Broad base;[1] R. hand on the hip, L. the arm out.

1st Count—Swing L. arm down, poise R. (Fig. 1.)

2nd Count—Bend L. arm, elbow up, poise L. (Fig. 2.)

Progression—(*a*) *1st Count*—Swing L. arm down, bending trunk forward (*trunk relaxed, knees straight.*) (Fig. 3.)

[1] Feet *straight* forward, the weight on the outer borders.

2nd Count—As in 1, count 2. (Fig. 2.)

Progression (*b*) POSITION—Feet together.

1st Count—Swing the L. arm down, charge to R.[1] (Fig. 4.)

2nd Count—As in 1, count 2. (Fig. 2.)

Facing Machine—II. POSITION—R. foot forward, L. hand on hip, R. arm forward, palm up.

1st Count—Swing R. arm down, poise forward. (Fig. 5.)[2]

2nd Count—Bend arm, elbow down and in, poise forward. (Fig. 6.)

Progression (*a*) *1st Count*—As in II, count 1.

2nd Count—Swing arm out,[3] poise forward. (Fig. 7.)

Progression (*b*) *1st Count*—Swing R. arm down, palm up, bend trunk forward. (Fig. 8.) (Bowing position.)

2nd Count—Swing R. arm out, poise forward. (Fig. 7.)

Progression (*c*) *1st Count*—Swing R. arm down, bend trunk forward (bowing position). (Fig. 8.)

2nd Count—Bend arm forward, elbow out, poise forward. (Fig. 9.)

3rd Count—Repeat 1st count.

4th Count—Swing R. arm out, poise forward. (Fig. 7.)

III. POSITION—Broad base, L. hand on hip, R. arm forward.

1st Count—Swing R. hand down to left ankle, bend and twist trunk left. (Fig. 10.)

[1] Always have the weight on the outer borders of the feet in charging.

[2] This forward poise is always taken with the chest high, the neck forced back, and no hollow in the back.

[3] Caution 1. Never swing the arm so far back that the chest is flattened. 2. The chin and neck must be forced back. The arm must be shoulder-high, neither above nor below.

2nd Count—Swing R. arm out, twist trunk right (chest forward, weight over the R. foot.) (Fig. 11.)

SECOND SERIES (WITH BOTH HANDLES)

L. Side to Machine—I. POSITION—Broad base, both arms to L., shoulder-high. (Fig. 12.)

1st Count—Swing arms down, bend trunk forward (knees straight, trunk relaxed). (Fig. 13.)

2nd Count—Swing arms down, poising to L., twisting to L., forcing chest up. (Fig. 14.)

Progression (a) 1st Count—Charge to R., swing the arms down, bend trunk forward. (Fig. 15.)

2nd Count—As in 1, count 2. (Fig. 14.)

II. POSITION—Broad base, right hand on hip, L. arm out.

1st Count—Shift hips to R. (weight on R. foot), bend trunk to L., swing L. arm down. (Fig. 16).

2nd Count—Shift hips to L. (weight on L. foot), bend trunk to R., swing the L. arm over head.[1] (Fig. 17.)

Facing Machine—III. POSITION—Broad base, arms forward, palms up.

1st Count—Swing *both* arms down past L. ankle, bending and twisting trunk to L., as in Fig. 10.

2nd Count—Swing both out to R., twisting trunk to R. (Fig. 18.)

3rd Count—Swing both out to L., twisting trunk to L.

4th Count—Swing both down past R. ankle, *bend*, twisting to R.

[1] Relax trunk and neck in side-bending. This whole exercise is a continuous movement.

5th Count—Swing out to L., twisting to L.

6th Count—Swing both out to R., twisting to R.

A *continuous* move to be done without pause between counts and without jerking.

IV. POSITION — R. foot forward, arms forward, palms up.

1st Count—Bend trunk forward (bowing position). (Fig. 8.) Swing *both* arms down.

2nd Count—Swing R. arm out, poise forward. (Fig. 7.)

V. POSITION—Feet together, arms forward, palms up.

1st Count—Swing arms down, bend R. knee upward, rising on L. toe. (Fig. 19.)

2nd Count—Swing arms down, bend L. knee upward, rising on R. toe.

HEAVY SERIES (WITH BOTH HANDLES)

Facing Machine—I. POSITION—Broad base *or one foot forward*, arms forward, palms up.

1st Count—Swing R. arm down. (Fig. 20.)

2nd Count—Swing L. arm down.

3rd Count—Swing R. arm out. (Fig. 21.)

4th Count—Swing L. arm out.[1]

L. Side to Machine—II. POSITION—Feet together, or nearly so, both arms to L., shoulder-high, palms up. (Fig. 22.)

1st Count—Charge to R., extending R. arm out to R. (*carrying the rope over and back of the head*), swinging

[1] A continuous movement. Swing the arms freely and twist freely from the hips, always keeping the chest high and forward.

L. handle down to R. foot, bending trunk to L. (Fig. 23.)

2nd Count—Swing arms down, twisting trunk to L., forcing chest up and forward, weight on L. foot. (Fig. 14.)

Facing Machine—III. POSITION—R. foot forward, arms forward.

[1]Alternate *upward* backward arm circles—a continuous movement—*i. e.* the L. arm begins its upward backward movement as the R. arm, coming forward, passes the hip (Fig. 24); and the R. arm begins its upward and backward movement as the L. arm, coming forward, passes the hip. (Fig. 25.) The body bends to the R. as the R. arm passes forward on the completion of the circle, and to the L. as the L. arm passes forward.

IV. POSITION—Feet together, arms forward, palms up.

1st Count—Swing arms down, raise R. leg forward,[2] rising on L. toe. (Fig. 26.)

2nd Count—Swing arms down, raise left leg forward, rising on R. toe.

V. POSITION—Broad base, arms out.

1st Count—Twist to L. from ankles (Fig. 27), bend trunk to R., swing R. arm down and back. (Fig. 28.)

[3]*2nd Count*—Twist to R. from the ankles (Fig. 29), bend trunk to L., swing L. arm down and back.

VI. POSITION—R. foot forward, arms forward.

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[1] Caution: Keep the chest well over the forward foot and do not bend backward. This is a body rather than an arm movement.

[2] The knee straight, the ankle extended.

[3] A continuous movement, with no break between the two counts, really a body-bending and twisting movement, in which the arms take little part.

1st Count—Swing R. arm up, L. arm down.[1]

2nd Count—Swing L. arm up, R. arm down.

VII. POSITION—R. foot forward, arms forward.

1st Count—Bend trunk forward (bowing position), swing arms down (Fig. 18—but use both arms instead of one).

[2] *2nd Count*—Bend arms forward (*i.e., elbows out*). (Fig. 9—but with both arms instead of one.)

3rd Count—Repeat count 1 (Fig. 7, both arms).

[2] *4th Count*—Swing the arms out (Fig. 7, both arms).

5th Count—Repeat count 1.

6th Count—Repeat count 2.

7th Count—Repeat count 1.

[2] *8th Count*—Swing the arms up. (Fig. 30.)

FLOOR-HEAD PULLEY EXERCISES

Facing Machine—I. POSITION—Kneeling, with *one* knee on the floor, the hands grasping and pulling the long side straps attached to the head-gear; the neck and trunk relaxed as much as possible. (Fig. 31.)

Exercise—Raise the trunk and head until the spinal column is straight, the neck pushed back as far as it will go (chin in, not tilted up). (Fig. 32.) Do *not* bend backward at the *waist-line*, and to avoid doing so, push the *upper chest* up and *forward* forcibly and elongate

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[1] Caution: Each time the arm is raised poise on the forward foot and force the chest forward and up. Turn the palms forward. See Fig. 30.

[2] Caution: Poise on the forward foot, almost or quite raising the rear foot, especially on the 8th count. Force the chest up and forward. Allow no hollow in the back.

the spine as much as possible by pushing up with the head.

Progression (*a*) POSITION—Kneeling with both knees on the floor instead of one.

Exercise—The same, with particular caution about keeping the chest forward and avoiding the hollow in the middle back.

Progression (*b*) POSITION—Standing—one foot forward and the trunk and neck entirely relaxed, as in Fig. 8 (bowing position).

Exercise—The same as before, straightening out the whole spinal column. The weight now shifts *entirely* to the forward foot, the rear toe barely touching as in (Fig. 5); the chest is over the forward foot, the head pushed up, and the shoulders are held down and back by the strong pull on the head straps.

Always avoid the *back bend*, for it lessens the work of the lazy neck and shoulder muscles, and at the same time brings strain to the abdomen.


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